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XXIV.

CONTRIBUTIONS TO AMERICAN BOTANY.

BY ASA GRAY.

Communicated March 13, 1886.

1. *A Revision of the North American Ranunculi.*

ALMOST half a century ago the North American species of *Ranunculus*, as then known, were hastily compiled for Torrey and Gray's Flora, with very little knowledge of original materials; and they have not been elaborated since. The following is a summary of a recent painstaking study of them.

§ 1. *BATRACHIUM*, DC. Although the European forms or species of this subgenus are numerous and difficult, only a few are known in North America, and these still need investigation.

We have among them a peculiar type, and our species may be presented in this form.

- * Styles subulate, not longer than the ovary, introrsely stigmatose, sometimes for the whole length: petals deciduous.
- + Submersed foliage capillary-multifid, in this country no other seen except far north and west: carpel-receptacle hairy.

R. CIRCINATUS, Sibth. Known by its short and sessile leaves, of rigid texture, forming an orbicular circumscription at right angles with the stem. Here belongs *R. longirostris*, Godron, the original from St. Louis. Sibthorp's name is preferred to the slightly earlier *R. divaricatus*, which, as Hiern has made out, belongs to *R. aquatilis*, var. *trichophyllus*.

R. AQUATILIS, L., we should still keep as a collective species, with the Linnæan name; the type of Linnæus being the form *heterophyllus*. This occurs in British America, and from North Alaska to California; but not a single specimen is known from the Atlantic United States. Instead, we have everywhere

Var. *TRICHOPHYLLUS*, — to keep up the earliest and most used specific name for the whole series of forms, — with many subvarieties.

The more rigid leaved forms are commoner westward. In New England and New York occurs the opposite extreme, with soft and flaccid leaves, commonly with longer divisions, which collapse completely on being drawn out of the water. Among the several names which may be taken up for it, *R. flaccidus*, Pers., is probably the oldest, and *R. submersus*, Godron, the latest.

+ + No submersed dissected leaves: carpel-receptacle glabrous.

R. HEDERACEUS, L. Collected in the year 1870, by Mr. J. M. M. Muir, in fresh-water marshes at Norfolk, Virginia, said to be "apparently indigenous at many stations." But, as it nowhere else occurs, it was probably introduced from Europe.

* * Styles long and filiform, with small terminal stigma: receptacle glabrous: petals not deciduous: submersed leaves very few or none.

R. LOBBII, Hiern in Seem. Jour. Bot. ix. 66, t. 114, as subspecies. Hiern has in general well indicated the characters of this very rare species of California, and probably of Oregon, (which Torrey had referred to *R. hederaceus*, comparing it with *R. tripartitus*.) having noted the stamens as only 5 to 9, and the carpels as 4 to 6, with the "style slender, usually long and curved." He adds "lateral," which is not the case in the flower, nor indeed at a later period. But he did not perceive how completely distinct and peculiar this species is in its style of thrice the length of the ovary from which it abruptly proceeds, straight (not "curved"), of same thickness from base to apex, where it bears a small and wholly terminal stigma; also, that the few akenes are enclosed in the marcescent-persistent sepals quite to maturity. The style withers away, only its base remaining as a tip to the akene. So far as known, the California plant, of only Bigelow's collection, shows neither roots nor submersed leaves. I have not seen Lobb's plant, from Oregon, from which some filiform-dissected leaves are figured; and Bigelow's does not bear akenes with such strongly ascending and continuous lines on the faces of the akene as are shown in Hiern's fig. 9.

§ 2. *OXYGRAPHIS*. Sepals herbaceous and persistent: carpels utricular. — In view of the two following sections and the great diversity in the texture of the carpels in other parts of the genus, there is not much doubt that *Oxygraphis* of Bunge should be re-manded to *Ranunculus*. If the fruiting carpels are truly "a dorso compressa," the genus may perhaps be retained, since they seem to have a certain likeness to those of *Myosurus*, especially to those of

the American *M. apetalus*. That is, they are of rather firm texture on the back, which is produced into the still firmer beak, while they are ventrally thin and utricular, and either laterally somewhat flattened or turgid. In fact, the figure by Schlechtendal, in Linnæa, seems fairly to represent the general form of the carpel, notwithstanding Ledebour's note to the contrary. Prof. Oliver called my attention to the fact that they are in a measure follicular, being disposed to dehisce or burst open ventrally. I have shown (in Bull. Torrey Club for January, 1886) that this is rather strikingly the case in all the species of *Myosurus*, where, nearly the whole length of the body of the semi-utricular akene being attached to the rhachis, a rather obvious sutural dehiscence takes place, or is readily produced by slight pressure, when the fruit falls away. As restored to *Ranunculus* the species take their older names of *R. Kamtschaticus*, DC. (which may probably occur on the American side of the strait), and *R. polypetalus*, Royle. As to *O. Shaftoanus*, by some oversight the authors failed to notice its nearer relationship to *R. glacialis* and *R. Andersoni*, q. v.

§ 3. PSEUDAPHANOSTEMMA. Petals (reduced to a long-unguiculate nectary) and petaloid (white) tardily deciduous sepals of § *Aphanostemma*, with lanceolate utricular carpels nearly of *Oxygraphis*; these lanceolate, tapering into a slender style, thin-membranaceous throughout, compressed. Leaves round-reniform, 5-7-lobed and crenate-dentate.

R. HYSTRICULUS, Gray, Proc. Am. Acad. vii. 328. *Kumlienia hystricula*, E. L. Greene, Bull. Calif. Acad. i. 337. Besides *Oxygraphis* there are certain New Zealand and Aucklandian *Ranunculi* which approach this in the character of the fruit.

§ 4. CRYMODES, i. e. *glacialis*. Petals (rose-color, white, or rarely yellow) ample, and with the sepals marcescent-persistent: carpels wholly or partly utricular, compressed and broad: showy-flowered perennials, chiefly arctic-alpine.

* Akenes becoming partly coriaceous in age, and the scarious portion becoming a wing-like border, but still bilamellar and pervious.

R. GLACIALIS, L. Comes as near to our continent as Greenland.

R. CHAMISSONIS, Schlecht. Comes still nearer to our continent on the Asiatic side of Bering Strait. Akenes apparently more utricular and gibbous, and style longer than in *R. glacialis*, but little known.

* * Akenes wholly thin-utricular.

R. ANDERSONI, Gray, Proc. Am. Acad. vii. 327; Watson, Bot. King Exp. 6, t. 1. Habit and foliage nearly of the preceding.

R. SHAFTOANUS, *Oxygraphis Shaftoana*, Aitch. & Hemsl. in Jour. Linn. Soc. xix. 140, t. 3, of Afghanistan, is clearly a congener, with simply ternatisect, instead of triternatisect leaves.

§ 5. CYRTORHYNCHA (Benth. & Hook.), Gray, Proc. Acad. 1863, 56. Petals (yellow) bearing a prominent callosity instead of nectariferous pit and scale: carpels 10 to 18, *Thalictrum*-like, being terete and prominently about 10-costate, subcoriaceous and somewhat utricular, tipped with an *inflexed* style.

R. NUTTALLII, Gray, l. c. *Cyrtorhyncha ranunculina*, Nutt.

§ 6. HALODES. Like *Euranunculus*, but mature carpels thin-walled and utricular, the sides nerveose: scapose and flagelliferous. — Here *R. plantaginifolius*, Murr. (*R. salsuginosus*, Pall.? DC., *R. Ruthenicus*, Jacq.) of Siberia, and the very widely diffused

R. CYMBALARIA, Pursh. Greenland, N. and Central Asia, the whole breadth of N. America, to extra-tropical S. America.

§ 7. EURANUNCULUS. Petals (with nectariferous pit and scale, usually yellow) and sepals deciduous: akenes crustaceous or firm-coriaceous, the sides nerveless, not transversely rugose.

* Petals white, 8 to 10: sepals 3 or 4.

R. PALLASII, Schlecht. Alaskan Islands to Labrador fide *E. Martens*, but this needs confirmation. Lapland, Arctic E. Asia.

* * Petals in ours yellow, commonly 5, in a few species reduced to 3, in others increased to 6 or 8, or even 10 to 16.

+ Amphibious aquatic, with submersed foliage of § *Batrachium*.

R. MULTIFIDUS, Pursh, with its var. TERRESTRIS, and various intermediate forms. No one seems to know anything of the earlier homonym of Förskall, and so the present name seems by general consent to hold for the American species.

+ + Terrestrial and arctic-alpine perennials (or the first species rather amphibious and barely subalpine), creeping and fibrous-rooting, either from procumbent stems or from filiform rootstocks; the rounded leaves palmately 3-5-lobed or parted, but not divided nor filiform-dissected: flowers small.

++ Leafy-stemmed and rooting at the nodes, short-styled, and akenes in a globular head.

R. NATANS, C. A. Meyer. To this, rather than to *R. multifidus*, should be referred *R. radicans*, C. A. Meyer, and *R. Purshii* of Torr. in Ann. Lyc. N. Y. ii. 162.

R. HYPERBOREUS, Rottb.

++ ++ Scapose from filiform rootstocks, oligogynous, and long-styled.

R. LAPPONICUS, L.

+ + + Uliginous or subaquatic, fibrous-rooted, with entire or merely denticulate or crenulate and petiolate leaves.

++ Akenes beakless or nearly so, dull: subannuals, sometimes rooting from the lower nodes, but hardly thereby perennial.

= Petals 1 to 3 or 5, not over a line long: stamens 5 to 10.

R. TRACHYSPERMUS, Engelm. Pl. Lindh. i. 3, no. 2 (not Ell.), excl. var. *Lindheimeri*. Carpel-heads oblong or cylindraceous. — Louisiana and Texas.

R. PUSILLUS, Poir. — New York to Texas. *R. Bonariensis*, Poir. is very near to this, and of no older date. *R. fontanus*, Presl, of S. Italy, is also near, and perhaps was introduced from America.

Var. LINDHEIMERI. A small form, with akenes more papillose-roughish, but traces of this are not uncommon in *R. pusillus*. — *R. trachyspermus*? var. *Lindheimeri*, Engelm. Pl. Lindh. i. 3; Torr. Pacif. R. Rep. iv. 62. — Galveston, Texas, *Lindheimer*. California, in Napa Valley, *Bigelow*, and San Rafael, *J. P. Morse*, from *E. L. Greene*. Widely distant stations; but the plants seem to be specifically the same.

= = Petals 5, bright yellow, surpassing the calyx, 1 to 3 lines long: stamens numerous: style wholly deciduous.

R. OBLONGIFOLIUS, Ell. *R. pusillus*, var. *oblongifolius*, and *R. Flammula*, var. *laxicaulis*, Torr. & Gray, Fl. i. 16, 17. *R. Texensis*, Engelm. Pl. Lindh. i. 2. — Illinois and S. Carolina to Texas.

++ ++ Akenes subulate-beaked (but beak sometimes deciduous or reduced to an apiculation), in a globular head: petals 5 or more.

= Perennial by rooting from the nodes of creeping or the lower nodes of ascending stems, wholly fibrous-rooted.

R. HYDROCHAROIDES, Gray, Pl. Thurb. in Mem. Amer. Acad. v. 306. — S. Arizona, *Thurber*, *Capt. Smith*, *Rothrock*, *Lemmon*, to Southern California east of the Sierra, *Kellogg*. *R. stolonifer*, Hemsl., of Northern Mexico, is related to this, but is much smaller-flowered. Both have cordate lower leaves.

R. FLAMMULA, L., of which we have not the type, but only var. INTERMEDIUS, Hook. (from Lake Ontario to California and northward), and var. REPTANS, E. Meyer.

R. AMBIGENS, Watson, Proc. Am. Acad. xiv. 289, & Bibl. Ind. 16. *R. Flammula* & *R. Lingua* of Pursh, &c. *R. Flammula*, Torr. &

Gray, l. c., excl. var. *R. alismæfolius*, Benth. Pl. Hartw. 295, as to the Eastern plant only, & Gray, Man. 41, not Geyer. — Canada to Georgia. The American analogue of *R. Lingua*.

= = Strictly perennial, with thickened-fibrous and fascicled roots, terrestrial: stems short, erect or assurgent, not rooting from nodes above ground: mature akenes turgid, and with introrsely apical or subapical rather short subulate beak.

R. ALISMÆFOLIUS, Geyer, fide Benth. Pl. Hartw. 295, as to Geyer's original and the Hartweg plant, but not the Eastern species, as is well shown by Watson, Proc. Am. Acad. xix. 289. — Idaho to California. *R. Bolanderi*, Greene, Bull. Calif. Acad. ii. 58, answers to the type of this species.

Var. *ALISMELLUS*, Gray, Proc. Am. Acad. vii. 328, &c. The var. *montanus*, Watson, Bot. King, is partly this, partly a larger form which answers better to the robuster type of the species. The Asiatic *R. Pseudo-Hirculus*, Schrenk, which I had collated to this, is quite different, and probably an entire-leaved form of *R. pulchellus*.

R. LEMMONI, Gray, Proc. Am. Acad. xi. 69. Has more turgid and villous-pubescent akenes in an oblong head; and the lower part of the low stem is often villous. It has been found only in Sierra Valley by its discoverer, *Lemmon*, and in S. Utah by *Siler*. Specimens of the preceding have been distributed under this name, leading to some confusion.

+ + + + Terrestrial species, with at least some lobed or divided leaves, and no stoloniferous rooting or creeping stems, except in *R. repens* and *R. septentrionalis*. Under this head the remaining species are disposed.

++ Calyx clothed externally with long and soft black or brown hairs: arctic-alpine and low perennials, with solitary large flowers, none with leaves divided to base.

R. MACAULEYI, Gray, Proc. Am. Acad. xv. 45. Roots a fascicle of fleshy fibres: leaves short-petioled, soft pilose or soon glabrous, thick, varying from almost linear with truncate 2-3-dentate apex to obovate-spatulate and obtusely 3-10-toothed: petals flabelliform, crenulate, mostly half-inch long, deep yellow. — Also published in U. S. Engineers' Report, 1878, p. 1883, Ruffner's Expl., as *R. nivalis*. — Alpine region of the Rocky Mountains in S. Colorado, at 11,700 feet, *Lieut. McCauley, Mr. Pease*. This is too near *R. Altaicus*, Laxm., which is *R. frigidus*, Willd. and Reichenb. Ic. Crit. iii. t. 289, and the *R. sulphureus* of some authors. Mature fruit is wanting.

R. NIVALIS, L. Extends across Arctic America, and from Hudson's Bay to the Alaskan Islands. A high arctic form, *R. sulphureus*, Solander in Phipps, &c., comes very near to *R. Altaicus*.

++ ++ Calyx not dark-hairy: akenes not muricate nor rough-hispid.

= Leaves some of them quite entire (except in the first species), some simply few-lobed and the lobes entire: alpine or subalpine low perennials, with fascicled-fibrous or tuberous roots, glabrous.

a. Radical leaves round-reniform and with 5 to 9 roundish lobes or deep crenatures: akenes dorsally carinate and subulate-beaked, collected in an oblong head.

R. OXYNOTUS, Gray, Proc. Am. Acad. x. 68. — Higher Sierra Nevada, *Brewer, Lemmon*.

b. Radical leaves neither reniform nor cordate, nor several-lobed: akenes turgid and dorsally rounded, collected in a globose head.

R. GLABERRIMUS, Hook. Fl. i. 12, t. 5. — Rocky Mountains to those of the Sierra Nevada and Brit. Columbia; early flowering. *R. brevicaulis*, Hook. Lond. Jour. Bot. vi. 66 (but not of the Flora) is a form of this.

R. DIGITATUS, Hook. Kew Jour. Bot. iii. 124, t. 4. Smaller, heterophyllous, 5–11-petalous; the roots fleshy-thickened in the manner of *R. Ficaria*. — Rocky Mountains, and west to those of Nevada and Utah.

= = Leaves all palmately or pedately lobed or divided, small: akenes turgid-lenticular, acute or acutish on the back, tipped with a small subulate beak: strictly arctic-alpine perennials, fibrous-rooted from a short caudex, tufted, a span or less high: flowers mostly solitary, not large, their rounded petals little surpassing the calyx.

R. PYGMÆUS, Wahl. *R. Sabinii*, R. Br. — Throughout the breadth of Arctic America, and in the higher Rocky Mountains south to Colorado.

R. HOOKERI, Regel. Stouter: radical and often the very few cauline leaves biternately or pedately divided and parted, primary divisions sometimes petiolulate and the lobes linear-oblong or spatulate: stem 1–2-flowered: petals 3 lines long, surpassing the rounded sparsely and finely villous sepals: akenes a line long, in a globular head. — Pl. Radd. i. 47; Wats. Bibl. Ind. 19, not Schlecht. *R. pedatifidus*, Hook. Fl. i. 18, t. 6, not Smith, nor Schlecht. — Northern Rocky Mountains, *Drummond*. Gray's Peak, Colorado, *Patterson*, both in flower and fruit. The homonym of Schlechtendal is an extraordinary mixture,

and the Mexican plant, for which the name has by some been retained, has more than one earlier available name.

=== Leaves all 2-4-ternately parted or divided into numerous narrow divisions (of a line or less in width): akenes turgid, subulate-beaked, dorsally marginless, smooth and glabrous or nearly so: alpine or subalpine low perennials, with strong fibrous-fascicled roots, ascending stems and single or few large and showy flowers.

R. TRITERNATUS. Roots fleshy-fibrous: leaves usually triternately divided and parted; primary divisions long-petiolulate and lobes from filiform-linear to linear-spatulate, obtuse; petals broadly obovate (4 or 5 lines long): akenes very turgid, rounded dorsally, slender-beaked; the head globose, with a thick globular receptacle in the manner of *R. glaberrimus*. — Klikitat Co., Washington Terr., on high hills near Goldendale, *Howell*, by whom it has been distributed under the name of *R. Hookeri*. A very early-flowering and depressed form has broader radical leaves.

R. ADONEUS, Gray, Proc. Acad. Philad. 1863, 56, with syn. — High Rocky Mountains of Colorado and Utah; first coll. by Parry.

==== Leaves mostly cleft or more divided, some rounded radical ones undivided, but at least crenate or dentate: akenes turgid or lenticular, marginless.

a. Montane or high northern, truly perennials: flowers with conspicuous and rather large petals, except in one form of *R. affinis*.

R. ARIZONICUS, Lemmon in herb. Gray. A foot or less high, glabrate or above glabrous, below usually with some soft villous hairs: fascicled roots thickish: stems slender and naked above, several-many-flowered: radical leaves round-cordate or sometimes cordate-oblong and strongly crenate-dentate, or later ones 3-7-cleft and segments 3-5-lobed; cauline once or twice 3-parted into narrow linear divisions: petals 5 to 7, oblong or obovate (3 to 5 lines long): akenes lenticular with thin and acute margins, lightly pubescent, commonly in a small globular head, having a subulate receptacle. — The plant sent by Mr. Lemmon with this name is the same as C. Wright's no. 837, also from S. Arizona, and which was taken for a form of *R. affinis* in the Botany of the Mexican Boundary. It grows in rather dry soil.

Var. SUBAFFINIS. Low, 1-few-flowered, like *R. affinis*, except the (equally pubescent) sharp-edged akenes, almost equalled by the subulate style. — Mt. Agassiz, *Lemmon*. A form from S. Arizona, *Rothrock*, connects with the following.

Var. SUBSAGITTATUS. Rather stout, decidedly villous, but the

pubescence deciduous: radical leaves mainly subcordate-oblong or obscurely sagittate, the middle nerves approximate: petals broadly obovate, half-inch long: akenes in a larger and oval head. — North Arizona in De la Vergne Park of the San Francisco Mountains, in wet ground, *Lemmon*.

R. SUKSDORFII. A span or less high, glabrous, 1–3-flowered: leaves small, somewhat reniform or flabelliform, 3–5-cleft or parted, divisions of the radical ones 3–5-cleft or incised, of the cauline linear: petals round-obovate, retuse, a third to half an inch long, deep yellow: akenes glabrous, turgid-lenticular, acutish-edged, surmounted by a nearly filiform style of equal length (three fourths of a line), which is apparently deciduous in age. — Mount Adams, Washington Terr., at 6,000 to 7,000 feet, in damp ground, *Suksdorf*.

2. Heads of carpels in fruit oblong or cylindraceous; akenes more turgid, rounded or at least obtuse on the back.

R. ESCHSCHOLTZII, Schlecht. This species has somewhat singularly been referred to *R. nivalis*, but its nearest relative is *R. affinis*. It has a much longer, slender-subulate, and mostly straight style.

R. AFFINIS, R. Br., has a small and mostly recurved style, much shorter than the ovary, at most only a quarter of the length of the akene, and often its thickish base only persists at maturity. These characters and the globular akenes well distinguish it from *R. auricomus*, L., of the Old World, to which some have referred it.

Var. VALIDUS. Taking the slender high-northern form with even the radical leaves sometimes “pedately multifid” as the original of the species, the above name may be given generally to the stouter and larger forms, of lower latitudes or elevation, with more succulent leaves, the radical mostly undivided and roundish, either cordate or truncate or cuneate at base, and from coarsely crenate to 3–7-cleft or parted, some later ones occasionally divided and even with the divisions petiolulate. To this belongs *R. cardiophyllus*, Hook., figured both in the Fl. Bor.-Am. and in Bot. Mag. t. 2999, but with the style too long.

3. Head of carpels in fruit globose; styles minute and straight.

R. RHOMBOIDEUS, Raf. Prec. Decouv. 36? & Goldie in Edinb. Phil. Jour. t. 11, f. 1; Hook., etc. As Rafinesque gives the habitat “Canada and Genessee,” we may well suppose this was his plant; otherwise, his must remain wholly obscure. *R. brevicaulis*, Hook. Fl. i. 13, t. 7, is evidently a much depressed form of this species; and here also may be referred *R. auricomus*, var. *Cassubicus*, E. Meyer, Pl. Labrad. 96.

b. Pacific-coast species, large-flowered, long-styled, perennial.

R. BLOOMERI, Watson, Bot. Calif. ii. 426; found only in low grounds on San Francisco Bay. To this well-marked species may probably be referred *R. Chilensis*, Hook. & Arn. Bot. Beech. 134.

c. Chiefly Eastern N. American or cosmopolite, small-flowered, very short-styled; with compressed and small very short-beaked or beakless akenes, and slender-fibrous roots: biennial, or short-lived perennial, or, at least in the second species, annual.

R. ABORTIVUS, L., which passes freely into var. *micranthus*, Gray, Man. 42 (*R. micranthus*, Nutt., with hairy stems and some divided root-leaves), not smaller-flowered than the type. Connects with

Var. HARVEYI, which produces conspicuous petals, even 3 lines long, and very much surpassing the calyx. — On damp rocks in Arkansas, *F. L. Harvey* and *Dr. Hass*.

R. SCCLERATUS, L. In the Eastern United States this has the look of an introduced plant, but doubtless indigenous in the interior, where it has a wide range.

= = = = Leaves variously cleft or divided: akenes compressed, generally flat, surrounded by a firm or indurated margin: none truly alpine or arctic.

a. Perennials with globular or ovoid carpel-heads (*R. Pennsylvanicus* and perhaps *R. hispidus* excepted), the akenes smooth or in some barely pubescent: mostly fibrous-rooted.

1. *Hook-styled*; the long styles recurving (at least in age) and wholly persistent in a rigid and uncinat elongated beak: petals only 5: stems erect: radical leaves hardly ever divided into separate leaflets. — *Oncostyli*, Gray, Proc. Am. Acad. viii. 373, excl. spec. 1.

R. RECURVATUS, Poir. Petals reflexed with and shorter or hardly longer than the reflexed calyx: akenes glabrous, but their receptacle hairy. — *R. lanuginosus*, Spreng., not Poir. *R. saniculæformis*, Muhl. *R. tomentosus*, Spreng., not Poir. — An Eastern species, extending westward to the Lake of the Woods.

R. OCCIDENTALIS, Nutt. To this wholly Western species — widely ranging geographically and in diversity — I am now constrained to join *R. Nelsonii*, Gray, Proc. Am. Acad. viii. 374 (*R. recurvatus*, var. *Nelsoni*, DC. Syst. i. 290); indeed, Nuttall's plant, now known in better original specimens, proves to be essentially that which I had taken as the type of *R. Nelsonii*. It is also, I believe, *R. Schlechtendalii*, Hook., Fl. i. 21 (although the fruit of that is unknown), as to the

specimens described, but not the plant of Schlechtendal which furnished the name, and which therefore would be the type of Hooker's species; wherefore his name would not supersede Nuttall's for the present species. The carpel-receptacle is naked and glabrous, and so not rarely are the akenes; but these, at least when young, are apt to bear some scattered and bristly hairs, especially along the dorsal margin, or also on the faces. The extreme forms, — very widely different in appearance, — as now regarded, are

Var. ROBUSTUS. A span to a foot or more in height, stout-stemmed and ample-leaved, large-flowered; the obovate petals 5 or 6 lines long; and carpels even 2 lines long, numerous in the head. — *R. occidentalis*, Gray, Proc. Am. Acad. viii. 374. *R. n. sp. forma prima, flores magni*, Schlecht. Animad. Ranunc. ii. 28, under *R. recurvatus*. — Chiefly Alaskan.

Var. LYALLI has rather large and thin leaves, short peduncles, and petals not longer than the calyx, — in all these points so much like *R. recurvatus* that it might be taken for a Western form of that species; but the carpel-receptacle is glabrous and the carpels themselves sparsely hispid with the peculiar bristly hairs of the present species. Lyall's specimens are from Pend Oreille River, in Idaho. But a similar form is found on the Oregon, near Portland, by *Howell*, where it passes evidently into the following.

Var. TENELLUS. Slender, sometimes tall and stems with long internodes, often glabrate: leaves simpler and smaller: flowers small: petals commonly oblong, paler, only 2 or 3 lines long: akenes fewer in the small heads, sometimes very few: styles, as in the preceding forms, persistent as a stout and flattened-subulate hooked beak and equalling or somewhat shorter than the akene; this either glabrous or bristly. — *R. tenellus*, Nutt. in Torr. & Gray. *R. Nelsonii*, var. *tenellus*, Gray, Proc. Am. Acad. viii. 374. *R. forma secunda*, Schlecht. l. c.? — In wet and shady woods, and "flowering as a winter-annual" (*Howell*), whence probably its slenderness.

Var. EISENI. More or less slender: petals 2 or 3 or even 4 lines long: akenes glabrous, with a beak of only about half their own length. — *R. canus*, Torr. Pacif. R. Rep. iv. 62, not Benth. *R. Eisenii*, Kellogg, Proc. Calif. Acad. vii. 115. — Sierra Nevada, California, to the Columbia River.

Var. RATTANI. Differs from the last variety only in the akenes, which become roughish-papillose, and are sparsely or thickly beset with short hairs; the strongly curved beak sometimes much and sometimes little shorter than the body of the akene. — N. California, on the

Klamath, *Rattan*, and adjacent Oregon, in Josephine Co., *Howell*; the latter a transition toward the typical *R. occidentalis*.

2. *Broad-hook-styled*, i. e. the recurved uncinat styles shorter than the ovary, broad and flat, stigmatose for most of their length, wholly persistent in a very strong and flat triangular or gladiate and hooked or curved beak which is much shorter than the flat akene: and confluent with its sharp margin: radical leaves divided or nearly so: petals only 5.

R. ACRIFORMIS. A foot high, strict, with pubescence in good part appressed: leaves all palmately or pedately and deeply 3-5-parted or even divided, and often again 2-3-cleft into narrower lanceolate or linear segments and lobes: petals orbicular-obovate, one fourth inch long, hardly double the length of the spreading calyx: akenes over a line long; beak of half their length. — *R. acris*, Hook. Fl. i. 18, partly, & Lond. Jour. Bot. vi. 66, not L. — Northern Rocky Mountains, lat. 58°, *Drummond*. Wyoming, *Parry* (distrib. as *R. affinis*). Wind River, *Dr. Forwood*, and near Cheyenne, *Greene*.

R. CANUS, Benth. Erect and robust, soon declining, densely soft-villous with white hairs when young, becoming greener and sparsely villous or glabrate: leaves or most of them 3-divided, and the middle or all three leaflets petiolulate, commonly cuneate and 2-3-cleft, with the lobes incised; petals obovate, half-inch or less in length, fully double the length of the soft-villous reflexed calyx: akenes $2\frac{1}{2}$ to 3 lines long, the very broad beak less than a line long, forming part of the margin. — Pl. Hartw. 295. *R. Californicus*, var. *canus*, Brewer & Watson, Bot. Calif. i. 8. *R. occidentalis*, var., Gray, Proc. Am. Acad. viii. 374. — Low ground in the valley of the Sacramento, *Hartweg*, in flower only, but the hooked styles discerned by Benth. Near Chico, *Mrs. Bidwell*, specimens just received in flower and fruit, from the district where Hartweg found it, enabling the completion of the character. There are other specimens from the region, in blossom only, which may belong to this species. The name is appropriate only to Hartweg's specimens; the white and soft pubescence being conspicuous only on the early growth.

3. *Short-styled*; the introrsely stigmatic styles thickish-subulate and mostly all persisting in the short (straight or recurved or even hooked) beak: herbage hirsute or pubescent.

- o Lax or weak-stemmed, Californian: no stolons: petals (rarely 5?) 6 to 15: beak of akenes stout-subulate, more or less hooked.

R. CALIFORNICUS, Benth. *R. dissectus*, Hook. & Arn. *R. del-*

phnifolius? Torr. & Gray, not Hook. The typical form narrow-leaved, but passing freely into

Var. *LATILOBUS*, a common coarse-leaved and more robust form. *R. Ludovicianus*, Greene, Bull. Calif. Acad. ii. 58.

o o Strictly erect species, nat. from Europe: no stolons: very short styles stigmatic for all or most of their length: petals 5, broad.

R. ACRIS, L. Possibly native in Newfoundland, as it is thought to be in Greenland.

R. BULBOSUS. Sparingly naturalized in most of the Eastern Atlantic States, copiously so in Eastern New England.

o o o Erect or ascending, not stoloniferous, 5-petalous: stout subulate style stigmatose for much of its length, persisting in a straight or merely oblique beak: roots fibrous, of short duration.

R. PENNSYLVANICUS, L. f. Well marked by its stout and tall upright leafy stem, annual or subannual root, rough-hirsute and widely spreading pubescence, ternately dissected leaves with petiolulate leaflets, petals not surpassing the reflexed calyx, and spicate (oblong or cylindraceous) head of short-beaked akenes.

R. HISPIDUS, Michx., partly, DC., Hook. Ascending or declined, usually but not always hispidly hirsute with spreading hairs, annual or biennial, or sometimes perhaps more enduring (the fascicled roots either slender or thickening): stems few-leaved, when reclining rarely if ever rooting: leaves all ternately compound: leaflets mostly slender-petiolulate in the manner of the preceding species, and of similar subdivision: peduncles rather long: petals obovate, mostly 3 lines long, surpassing the spreading or hardly reflexed and early deciduous calyx: akenes mostly a line and a half long, and with stout and straight (about half a line long) beak formed of the whole flat subulate style: head globular or at most oval. — Has been confounded with the preceding species, to which it is most related, and with *R. septentrionalis*, as well as with the true *R. repens*. But it has not the truly perennial roots of either, nor has it the creeping stolons of the one or the slender-tipped styles of the other. This is a Northern and Western species, extending from Canada to the Pacific coast and south to Colorado and Utah. The character “*stylo brevissimo*” marks it as the plant which De Candolle took up in Michaux’s herbarium, and that probably came from Canada, while the other specimen, which De Candolle described as his *R. Carolinianus*, would be the one to which Michaux’s habitat “*Carolinæ Inferioris*” belongs. We therefore cite *R. hispidus*, Michaux, Fl. i. 321, partly; DC. Syst. i. 289; Hook. Fl.

i. 19. The specific name is generally appropriate, but on the Pacific coast there is a smoothish or smooth form, viz. : —

Var. OREGANUS. Lucidulous, and with only scattered hairs, or sometimes hardly any. — *R. nitidus*, in part, Hook. Fl. i. 20. — Shady and wet grounds, Oregon, on the Columbia, to Fraser River. I use the name which Messrs. Howell and Henderson have proposed for this as a species.

o o o o Ascending, also creeping by procumbent rooting branches or stolons: short-subulate styles stigmatose for the whole length, and all or nearly all persistent in the beak: principal leaves of ovate or roundish outline, not rarely white-variegated or spotted above, some only 3-parted, some divided, and with the middle lobe petiolulate; lateral ones either petiolulate or sessile.

R. REPENS, L., and partly so of American authors. — Low grounds, Nova Scotia and Canada to Virginia, New Mexico, &c., generally only in waste grounds near the coast, where it is naturalized from Europe, but also indigenous in some places. Here belongs *R. Clintonii*, Beck, Bot. 9, doubtless an introduced plant.

3. *Long-styled* and mostly long-beaked, i. e. styles more or less elongated and attenuate upward, stigmatose only at or near the tip, sometimes all persistent, more commonly with the slender upper part deciduous or at length breaking away from the basal, which remains as a beak: perennials.

o Petals 5: primary radical leaves or some of them (at least in dry soil) commonly undivided and only 3-parted, but succeeding ones 3-5-foliate.

R. SEPTENTRIONALIS, Poir. This I take to include the greater part of the assemblage of forms which have passed for *R. repens* in this country. It includes *R. septentrionalis*, *Marilandicus*, *tomentosus* (hairy form), *lucidus* (glabrous form), and *repens*, var. of Poir, Dict. vi. 112-127: also *R. hispidus*, Michx., as to the Southern plant upon which was founded *R. Carolinianus*, DC.; *R. nitidus*, Muhl., not Walt.; *R. Belvisii*, DC.; *R. palmatus*, Ell.; *R. fascicularis*, Schlecht. Animad. Ranunc. ii. 30, t. 2, (not truly of Muhl.,) therefore the *R. Schlechtendalii*, Hook. as to type; and *R. intermedius*, Eaton. *R. Philonotis* and *R. lanuginosus* of Pursh are probably of this species, mistakenly named. The species ranges from New Brunswick to Manitoba and south to Texas. In wet ground some summer stems are procumbent or sarmentose, and these occasionally strike root at the nodes.

R. FASCICULARIS, Muhl. (Cat. 54), Bigel. Fl. Bost. ed. 1, 137; Hook. Fl. i. 20, t. 8; Gray, Gen. Ill. i. t. 9. Known by its dwarf and tufted habit, tuberous-thickened roots, mostly appressed pubescence, and the disposition to pinnate or quinate division of the principal leaves; the style and beak longer, and the lenticular akenes less margined. — Canada and E. New England to Texas, and north-west to Winnipeg; flowering early.

o o Petals 7 to 16: no creeping nor procumbent basal stems.

R. MACRANTHUS, Scheele in Linnæa, xxi. 685. Hirsute: stems erect and a foot or two high, or 2 to 3 feet long and declining, commonly robust: leaves nearly as of *R. septentrionalis*, but many quinate: petals from a third to nearly a full inch long, from obovate to oblong: akenes mostly numerous in a large head, ovate or orbicular, conspicuously thin-edged, at length with a rather short and broad flat-subulate beak, the slender upper portion of the long and straight style falling away. — *R. repens*, var. *macranthus*, Gray, Pl. Lindh. i. 141, & Pl. Wright. — Low ground, Texas to S. W. Arizona, first coll. by Wright and Lindheimer.

R. ORTHORHYNCHUS, Hook. From hirsute to nearly glabrous: stems erect, a foot or two high from a fascicled root of thick fibres: leaves mostly of oblong outline and pinnate division into 5 or 7 leaflets or segments, these again usually cleft or incised: petals a third to half inch long, obovate, much surpassing the reflexed soon deciduous calyx: akenes usually not numerous in the head, ovate, nearly two lines long, strongly margined, bearing a slender-subulate rigid and quite straight beak of about the same length, consisting of the wholly persistent style. — Wonderfully various in foliage: the typical form, *STENOPHYLLUS*, has all the leaves somewhat bipinnately dissected into segments of a line or less in width, or some radical ones simply divided into cuneate or obovate 2-3-lobed or toothed segments or leaflets. — *R. orthorhynchus*, Hook. Fl. i. 21, t. 9. *R. dichotomus*, Schlecht. in Linnæa, vi. 579, but not the Mexican species. — Wet ground, W. Oregon and British Columbia. Passes freely into

Var. *PLATYPHYLLUS*. Robust, commonly large, sometimes 2 to 4 feet high, and leaves with limb 2 to 4 inches long; the ample segments or leaflets 1 to 3 inches long, from oblong or rhomboidal to ovate, laciniately cleft or incised: petals from a quarter to three quarters of an inch long. — *R. macranthus*, Watson, Bot. King Exped. & Bot. Calif., not Scheele. — In wet places, Wahsatch Mountains and Idaho to E. Oregon, and California, south to Marin Co.

- b. Annuals or biennials, all but one introduced from the Old World.
1. Akenes smooth and even, or at length sprinkled with some scattered papillæ, especially toward the margin: flowers moderately large and showy.

R. PARVULUS, L. Certainly this was not a happy name since, like all such annuals, it may vary from depauperate to robust. One perhaps might follow the majority of authors in superseding it, if they had at all agreed as to what name they would adopt in its place. The oldest after the Linnæan is *R. Sardous*, Crantz; next is *R. hirsutus*, Curtis; then *R. Philonotis*, Retz; and the oldest name after the Linnæan is the one least used. The species is very sparingly naturalized in N. America, in the vicinity of some Atlantic seaports.

2. Akenes papillose-scabrous, and hispidulous with hooked hairs: flowers very small: indigenous to the Pacific coast.

R. HEBECARPUS, Hook. & Arn. Indigenous analogue of *R. parviflorus*.

3. Akenes muricate or echinate: sparingly naturalized.

R. PARVIFLORUS, L. Very small-flowered: akenes rough-papillose.

R. MURICATUS, L. Large-flowered, broad-leaved: akenes strong-beaked, tuberculate or echinate.

R. ARVENSIS, L., has effected a precarious lodgment only in some ballast grounds: it has narrow-lobed leaves and strongly echinate akenes.

2. *Sertum Chihuahuense*.

Next in interest to our own botany is that of the northern part of Mexico adjacent to the United States, and especially that of the elevated interior region. Two collections have been made (for the most part in sufficient numbers for distribution) during the past year, in the Mexican State of Chihuahua; one by Mr. C. G. Pringle, along the line of the Mexican Central Railway, in the spring and in the autumn of 1885; the other by Dr. Edward Palmer, from August to November of the same year, in the Sierra Madre of the southwestern part of that State, with headquarters at the mining settlement of Batopilas, in some maps printed Batopolas. Both are collectors of experience in adjacent regions, particularly in Arizona, whence Mr. Pringle had in former years penetrated into Sonora, very beneficially for botany, but to the damage of his own health; Dr. Palmer had made two

important explorations in more eastward Mexican States, one in the year 1878, in connection with Dr. Parry, with headquarters at San Luis Potosi, the other in 1879 and 1880, in Nuevo Leon and Coahuila. Mr. Pringle is now returning to this promising field, making the town of Chihuahua his starting point, and with the hope of passing the summer in the Sierra Madre lying to the west of that place.

Having now determined the *Gamopetalæ* of these two collections of 1885, I here bring together some account of the new and otherwise noteworthy species. The numbers following the name of the collector are those under which the specimens are distributed. The specimens of Mr. Pringle's distribution are accompanied by full printed tickets.

Rubiaceæ.

COUTAREA LATIFLORA, DC. Prodr. iv. 350. "A large shrub, about ten feet high, rather compact, with several stems and very green leaves: in the cañons and mountains above Batopilas," *Palmer, H.* Called "Copalquin," and the bark much used as a substitute for quinine, &c., according to Dr. Palmer. The specimens are in fruit only, the long and narrow calyx-lobes marcescent on the younger fruits. They answer well to the figure of Moçino and Sessé, even to the "tuberculis sparsis" on the capsule, although these slightly-raised and light-colored spots, as well as the ribs, are exaggerated in the rude sketches. The seeds are as represented, and very broadly winged. The popular name, as recorded by Dr. Palmer, nearly agrees with the "Copalchi" of the Prodrômus.

HOUSTONIA POLYPREMOIDES. *Ereicotis, H. acerosæ* maxime affinis, at parum fruticulosa, laxius ramosa, spithamæa; foliis setaceo-subulatis minus crebris; floribus plerumque pedunculatis; corollæ (lin. 4 longæ) tubo calycem paullo superante. — Santa Eulalia Mountains, near Chihuahua, on gravelly limestone slopes. Corolla "white, changing to purple." *Pringle, 16 and 356.*

RANDIA PRINGLEI. Inermis; foliis ovalibus pube molli densa subcinereis subtus reticulatis basi in petiolum marginatum contractis; stipulis parvulis triangulari-subulatis; floribus in glomerulos sessiles terminales vel in axillis summis congestis; calycis lobis subulatis tubo supra ovarium crateriformi longioribus; corolla hypoc craterimorpha; tubo extus puberulo vix semipollicari lobis ovatis acuminatis parum longioribus; styli ramis brevibus discretis sursum incrassatis truncatis; ovarii biloculari, placentis in axi leviter connatis; fructu fide *Pringle* vetustate globoso pollicari, pericarpio fragili seminibus planis farcto.

— In cañons of the mountains near Jimulco, S. W. Coahuila. “A spreading shrub or low-branched small tree, with creamy-white and fragrant flowers.” *Pringle*, 142.

GENIPA ECHINOCARPA. *Randia echinocarpa*, DC. Prodr. iv. 385, and in Moçino & Sessé, Ic. ined. t. 469. “Called *Papache*. Shrub or small tree, 6 to 10 feet high, with sharp thorns; its numerous fruit covered with fleshy protuberances, of a dark green color outside; when ripe the inside is black, is much eaten, ripens in winter.” — At the hacienda San Miguel, near Batopilas, *Palmer*, A. The dried fruit sent is firm-corticate, 2 inches in diameter, resembles the published tracing, except that a good number of the fleshy tubercles have developed into soft spines of nearly half an inch in length. The seeds, imbedded in the pulp, are not well preserved, but are flat and orbicular, and seem to be those of a *Genipa*; and there is no dissepiment. The spines of the branches are those of a *Randia*. Dr. Palmer sent no flowers. But I judge from the foliage that the flowering specimens of *Ervendberg's* collection at the settlement of Wartenberg, near Tantoyuca, distributed as “no. 239, *Randia*,” may be the same; that has a one-celled ovary, and subulate calyx-lobes.

MACHAONIA, Humb. & Bonpl. § PLATYANTHEA. Corolla tubo vix ullo fauce concava fere rotata. Spec. 2:—

MACHAONIA FASCICULATA, Gray, Proc. Am. Acad. xix. 77. Microphylla; foliis in axillis fasciculatis parvis subspathulatis. — Mexico, Coulter, no. 1167.

MACHAONIA PRINGLEI. Inermis: foliis (haud fasciculatis) lanceolatis utrinque acutis vel acuminatis subpetiolatis fere eveniis glaberrimis (1–2-pollicaribus); cymis laxe floribundis; floribus 4–5-meris; corollæ (albæ) lobis margine tenuiter undulatis. — S. W. Coahuila, on limestone ledges of the mountains near Jimulco, April, in flower: “a shrub 3 to 6 feet high,” *Pringle*, 146. The funiculus from the summit of the cell is attached to the oblong-linear ovule about half-way between its middle and the micropyle.

MITRACARPUS VILLOSUS, Cham. & Schlecht. in Linn. iii. 363 (name by implication), & DC. Prodr. iv. 572 (fairly similar to the W. Indian plant); Hemsl. Biol. Centr.-Am. Bot. ii. 61. Near Batopilas, *Palmer*, 38. Includes the plant of *Berlandier* which has been referred to *M. breviflorum*. Differs from that in pubescence, though not enough to merit the specific name, in more evident venation, and in bearing bristly hairs along the margins of the sepals, but not so strikingly as in *Jacquin's* figure. For the reason of a return to the original orthography of the generic name, see *Syn. Fl. N. Am.* ii. 32.

CRUSEA SUBULATA, Gray, Proc. Am. Acad. xix. (not Hemsl., which is an error for *C. subulata*, Hook. & Arn.), the *Borreria subulata*, DC., a common Mexican species, was collected both by *Pringle*, 314, and by *Palmer*, 423.

CRUSEA PALMERI. *C. Wrightii* similis, pariter annua gracilisque, ultrapedalis, sed puberula tantum; foliis angusto-lanceolatis; floribus brevissime pedicellatis, pedicello cum ovario didymo glabro nudo; calyce fere *C. parvifloræ*, Hook. & Arn., extus hirsuto, lobis latiusculis mucronatis; corolla albida infundibuliformi calycem vix dimidio superante, lobis ovatis sub apice uni-pauci-setiferis antheris æquilongis. — Shaded hillsides, about 25 miles south of Batopilas and at much less elevation, *Palmer*, 70.

SPERMACOCE MEGALOCARPA. *S. lævigatæ* ut videtur affinis, subpedalis e radice annua brachiato-ramosa, glabra; foliis ovatis oblongisve acuminatis membranaceis (1–2-pollicaribus) pinnato-nervosis, inferioribus longe subalato-petiolatis, summis basi contracta subsessilibus capitulum laxum involucrantis; vagina stipularum scariosa truncata setis paucis mollibus instructa rariusve nuda; floribus in pleris axillis perpaucis, in capitulo terminali sat numerosis; corolla styloque ignota (cito decidua): fructu ovali (lin. 3–4 longo) lævi coriaceo calycis lobis 4 filiformibus patentissimis mollibus ipso sæpe æquilongis superatis in carpella duo demum secedente, dissépimento tenui lato relinquire; semine elongato-oblongo. — Wet places in the higher mountains above Batopilas, *Palmer*, 185. With mature fruit and apparently young flowers, having also a fusiform ovary surmounted by the narrow linear calyx-lobes; but even in the youngest not a trace of corolla or genitalia to be found. We have no *Spermacocæ* of this habit, yet the fruit answers to the *Borreria* section of that genus.

Compositæ.

VERNONIA (FREMOSIS) STEETZII, Schultz Bip. in Seem. Bot. Herald, 297; a form with more slender heads. Ravines at the Frailes, half-way between Batopilas and the summit of the mountains, at about 7,000 feet. Stems herbaceous, “about 5 feet high,” *Palmer*, 273.

STEVIA STENOPHYLLA, Gray, Proc. Am. Acad. xv. 25. This species has now been collected, on shaded cliffs near Chihuahua, by *Pringle*, 677.

STEVIA SALICIFOLIA, Cav. Low forms with aristate pappus, and thinner leaves than usual, with now and then some coarse teeth. Higher mountains near Batopilas, *Palmer*, 278, 391. And the var.

nana, Gray, l. c., was found near Chihuahua, by *Pringle*, 677½, 102.

STEVIA VENOSA. *S. Plummeræ*, Gray, et *S. scabrellæ*, Benth. sat affinis, glabra, foliosa; caulibus ut videtur omnino herbaceis ultrapetalibus; foliis subsessilibus subcoriaceis (1–2-pollicaribus) fere integerrimis oblongo-lanceolatis acutis tripli- vel tri-nerviis venosis, venis prominulis adscendentibus laxè reticulatis modo *S. Plummeræ*; cymis compactis fastigiatis; pedicellis brevissimis; involucro vix lin. 3 longo sæpius 4-floro parum viscidulo-puberulo, bracteis obtusis; floribus saturate purpureis; pappo coroniformi brevi subcoriaceo margine eroso. — In a mountainous district, 150 miles north of Batopilas, November, *Palmer*, 376. Besides the entire leaves, the much shorter and firmer pappus-crown distinguishes this from the Arizonian *S. Plummeræ*.

STEVIA MADRENSIS. Subpedalis, scabrido-puberula vel glabella; ramis floridis subviscosis; foliis omnibus oppositis lanceolatis sessilibus membranaceis subtripplinerviis nervoso-venosis aut denticulatis aut fere integerrimis; capitulis laxè cymoso-fasciculatis subsessilibus; involucris bracteis (lin. 3 longis) obtusis; floribus lilacini-purpureis; acheniis glabellis; pappo coroniformi-concreto brevissimo. — Among Pines in ravines on the summit of the mountains, at about 8,800 feet, 150 miles north of Batopilas, October, *Palmer*, 328.

STEVIA PALMERI. Bipetalis, undique etiam ad involucria pilis brevibus patentibus mollibus pluriseptatis haud glandulosis subcanescens; foliis oppositis membranaceis subsessilibus obtusis, inferioribus oblongo-spathulatis bipollicaribus parum triplinerviis obtuse serratis basi cuneata integerrima, superioribus lanceolatis; cymis floribundis compositis; capitulis brevi-pedicellatis; involucris lin. 2 longi bracteis membranaceis acutiusculis; corolla alba, tubo brevi cum fauce lata extus villosa; acheniis glabris; pappo tripaleaceo et biaristato. — On the mountain-sides about 25 miles south of Batopilas, near the hacienda San Jose, *Palmer*, 30. Certainly allied to *S. paniculata*, Lag., possibly a very pubescent form of it.

STEVIA LINOIDES, Schultz Bip. in Linnæa, xxv. 284: var. *GRISEA*. Usque ad capitula crebra foliosissima, pube brevi canescens; corollis "flavido-albis." — In the mountains above Batopilas, at about 7,300 feet of elevation, October, *Palmer*, 251.

STEVIA LAXIFLORA, DC. Hort. Monsp., &c. *S. viscida*, HBK. Pine forest in the mountains, 150 miles north of Batopilas, *Palmer*, 418. To this must belong *S. amabilis*, Lemmon, first described in Proc. Am. Acad. xix. 1, where the character of the pappus is ambiguo-

ously drawn by me. Note that it is the *paleæ*, and not the *aristæ*, which are extremely short.

CARPHOCHÆTE WISLIZENI, Gray, Pl. Fendl. 65, & Pl. Wright. i. 89. An interesting rediscovery of the original species of this genus, not very far from the original habitat, viz. on the Cumbre, or highest part of the mountains, above Batopilas, at about 8,000 feet, *Palmer*, 331.

PIPTOTHRIX, Nov. Gen. *Eupatoriacearum Ageratearum*.

Capitula pluriflora. Involucrum campanulatum, e bracteis 7–8 lanceolatis haud nervatis subæqualibus, 1–2 extimis parvis additis. Receptaculum nudum planum. Corolla fauce e tubo æquilongo angusto subito ampliata lato-campanulata, lobis brevibus ovatis patentibus. Antheræ appendice hyalina ovata obtusa terminatæ. Styli rami prælongi, filiformes, sursum parum incrassati, obtusi. Achenia pentagona *Eupatorii*. Pappus pauci-setosus, caducus, setis 6–12 tenuibus rigidis inæqualibus barbellato-scabris corolla brevioribus.

PIPTOTHRIX PALMERI. Suffrutex glabellus; ramis gracilibus patentissimis; foliis oppositis submembranaceis brevi-petiolatis ovato-lanceolatis plerumque acuminatis subserratis supra basim triplinerviis laxè venosis, venulis creberrime minuteque reticulatis; capitulis parvulis in cyma terminali aut corymbiformi aut paniculata; acheniis ad angulos parce hirtellis. — Forma *α*, foliis bipollicaribus et ultra, floribus “albis.” Under trees near springs in the mountains above Batopilas, at the Frailes, at about 7,000 feet, *Palmer*, 274. — Forma *β*, foliis minoribus nunc latioribus magis serratis, floribus ochroleucis. Forming underbrush, about four feet high, on the hillsides, apparently near the same station (*Palmer*, 280); the “bloom yellow” according to the collector’s notes, but evidently no more than ochroleucous.

EUPATORIUM PALMERI. Bipedale, puberulum; caule suffrutescente ramisque gracilibus foliosis; foliis membranaceis oppositis ovatis et ovato-lanceolatis acuminatis (2–3-pollicaribus, petiolo $\frac{1}{3}$ – $\frac{1}{2}$ -pollicari) basi quandoque subcordatis triplinerviis laxè venosis subserratis, pagina superiore glabella, inferiore pilis crispatis saltem ad venas tenui-pubescentibus; panicula terminali laxa inferne foliata; capitulis 8–10-floris lin. 2 longis; involucri bracteis 5–6 lanceolatis subtrinerviis æqualibus, 1–2 brevioribus additis; styli ramis apice breviter clavatis per anthesin breviter demum longiuscule exsertis; acheniis pubescentibus. — Shady places, high up in the mountains above Batopilas, *Palmer*, 144, 263. Somewhat related to *E. solidaginifolium*, Gray, but nearer

to *E. filicaule*, Schultz Bip. in herbariis, — of which, not being in Hemsley's work, probably no character has yet been published.*

EUPATORIUM STRICTUM. Caulibus (ramisve) simplicissimis 2–3-pedalibus herbaceis minute puberulis cyma corymbosa polycephala terminatis; foliis oppositis dissitis (internodio dimidio brevioribus) orbiculatis subcordatis crenulatis serrulatisve (pollicaribus cum petiolo lin. 2 longo) submembranaceis hirsutulo-puberulis juxta basim trinervatis et divaricato-venosis, venis subtus prominentibus grosse reticulatis; capitulis lin. 3 longis pedicellatis; involucri campanulato 24-floro floribus paullo brevioribus, bracteis circ. 12 linearibus obtusiusculis æqualibus cum 1–2 brevioribus additis; corollis albis glabris; pappo albo; acheniis ad angulos hirtellis. — Sides of ravines under pine trees, near the Cumbre, or mountain summit above Batopilas, fully 8,000 feet of elevation, October, *Palmer*, 330.

EUPATORIUM GRANDIDENTATUM, DC. Prodr. v. 167, and probably *E. Pazcuarensis*, HBK., a narrow-leaved form. — Among rocks and bushes, 150 miles north of Batopilas, *Palmer*, 375.

EUPATORIUM VENULOSUM. *E. ageratoides* et *E. aromatici* soror, pariter ut videtur herbaceum, puberulum; foliis rhombeo-ovatis vel ovato-lanceolatis acuminatis (sesqui-bipollicaribus cum petiolo subsemipollicari) basi cuneata aut vix rotundata excepta argute modice-

* *E. FILICAULE*, Schultz Bip. in herb. Berol., Gray, &c. Caule (herbaceo?) cum ramis gracillimis patentissimis tenui-puberulis; foliis fere glabris membranaceis oppositis longe petiolatis deltoideis ovatisque acuminatis obtuse dentatis vel denticulatis, basi truncata vel subcordata rariusve subhastata; capitulis secus ramos divergentes subaphyllos thyrsoides racemosos; involucri 10-flori bracteis paucis lineari-lanceolatis. — Mexico, coll. *Ehrenberg*, no. 1176, and *Orizaba*, *Schaffner*, fide Schultz. We have it from *Orizaba*, coll. *Bilimek*, 1867, no. 576, and *Cordoba*, coll. *Bourgeau*, no. 1703. It needs to be compared with *E. polybotryum*, DC.

The following species is taken up from Seemann's collection:—

EUPATORIUM MICROCEPHALUM. Herbaceum (a basi?), vix puberulum; caule ultra-bipedali gracili subæqualiter folioso; foliis omnibus alternis ovatis acutis crenulato-serratis subtriplinerviis laxè venosis basi obtusa vel rotundata brevipetiolatis; panicula composita laxa ferrugineo-puberula; involucri simplici 5–6-phyllo 5–6-floro lineam longo, bracteis lineari-oblongis corollisque extus resinoso-atomiferis; acheniis ad angulos parce hirtellis. — “N. W. Mexico,” *Seemann*. Evidently the plant taken up by Hemsley, “Cerro de Pinal,” as *E. incomptum*, DC.; but it is not at all the plant of *Bourgeau* (no. 3330), nor of *Liebmann*, so referred, the heads and flowers of which are very much larger, and in agreement with *DeCandolle's* character.

EUPATORIUM AREOLARE, DC., and *E. brevisetum*, DC., species placed next each other in the *Prodromus*, would appear to be one and the same. *Ghiessbreght's* no. 530 has the short pappus.

que serratis trinervatis, venulis subprominulis subtiliter reticulatis; cyma polycephala corymbosa; pedicellis gracilibus breviusculis; capitulis 8-10-floris (lin. 4 longis); involucri bracteis 8-10 oblongo-linearibus tenuibus extus glanduloso-pubentibus corollis albis nunc purpureo tinctis omnino glabris dimidio brevioribus. — Shady ravines under pine trees on the higher mountains (8,000 feet) above Batopilas, October, *Palmer*, 329. I do not identify this with any described species. The reticulation of the veinlets is more conspicuous and finer than in any of its allies.*

BRICKELLIA GLUTINOSA. Frutex humilis, ramosissimus; foliis parvis (lin. 2-3 longis) cuneatis vel flabelliformibus inciso-dentatis coriaceis fere eveniis glutinosis in petiolum lamina parum breviorum attenuatis oppositis et alternis; capitulis brevi-pedunculatis ramulos terminantibus semipollicaribus circiter 15-floris; involucri bracteis obtusis, extimis lato-ovalibus, intimis linearibus; acheniis parce minuteque hispidulis. — S. W. Coahuila, on arid limestone cliffs of the mountains near Jimulco, Coahuila, *Pringle*, 143.

BRICKELLIA BRACHIATA. Inter *B. grandifloram* var. *minorem* et *B. Coulteri* collocanda, minute pubescens; caule erecto a basi ut videtur herbaceo bipedali ad apicem usque subæqualiter folioso; foliis (poll. 1-2 longis cum petiolo semipollicari) deltoideis vel hastato-subcordatis parce grosseque dentatis; capitulis sat numerosis longiuscule pedunculatis sparsisque in ramis divaricatis paniculæ cymæformis foliatæ; involucrio glabro cum floribus 10-12 semipollicari, bracteis fere omnibus obtusis, extimis ovalibus. — At the base of the mountains near Batopilas, in shade, *Palmer*, 169.†

APLOPAPPUS TENULOBUS. *A. aureo* affinis, subpedalis e radice annua, caule a basi ramoso cum involucrio viscoso-puberulo; foliis glabris in lobos angusto-lineares rhachi haud latiores setuloso-mucronatos pinnatipartitis; involucrio hemisphærico (lin. 5 alto), bracteis numerosis lineari-lanceolatis fere omnino herbaceis parum imbricatis discum æquantibus, exterioribus vix brevioribus; ligulis 15-20 ob-

* Dr. Palmer also collected *Eupatorium collinum*, DC. (271), *E. Schaffneri* Schultz Bip. (332), *E. Guadalupense*, Spreng. (276), and *E. occidentale*, Hook., var. *Arizonicum*, Gray, running into forms which will provoke the separation of this from the plant of the Pacific coast. Mr. Pringle collected the same plant (his 613), also *E. Greggii*, Gray (247), *E. Parryi*, Gray (135), *E. Wrightii*, Gray, (600), and *E. petiolare*, Moçino (266).

† *Brickellia simplex*, Gray, was collected both by Palmer (436) and by Pringle (641); the former obtained also some forms of *B. betonicæfolia*, Gray (434, 435), and the latter, forms of *B. Wislizeni*, Gray (323, 609), and several other species, also *Barroeta subuligera*, Gray (346).

longis (lin. 4 longis) læte aureis; styli ramis brevibus appendice ovato-lanceolata parte stigmatosa æquilongia; acheniis turbinatis villosissimis; pappo rigido valde inæquali, setis validioribus aristisve corolla disci brevioribus achenio duplo tantum longioribus. — Mountainous country about 150 miles north of Batopilas, *Palmer*, 408.

ACHÆTOGERON PALMERI. Glabellus, pube minuta strigulosa tantum puberulus; caulibus strictis bipedalibus e radice (ut in affinibus) perenni subæqualiter foliosis oligocephalis; foliis linearibus imisve subspatulatis integerrimis; involucri multibracteato striguloso-puberulis; ligulis perplurimis angustis albis (in tubulo pl. m. styliiferis sed sterilibus?); styli ramis fl. herm. appendice brevi ovata obtusa superatis; ovariis obovatis compressis ad margines nervatis; pappo brevissimo setuloso-coroniformi. — Shady woods on the summit of the mountains above Batopilas, at about 8,800 feet, *Palmer*, 362.*

ACHÆTOTERON AFFINIS. Præcedenti proximus, pilis patentibus (parte inferiore præsertim) hirsuto-pubescentibus; foliis membranaceis, inferioribus angustispatulatis acutatis rariter argute dentatis, summis linearibus integerrimis; capitulis dimidio minoribus; ligulis minus numerosis (40–50) albis ut videtur omnino *neutris*; styli ramis fl. herm. deltoideis acutissimis; acheniis parce puberulis subcompressis margine utroque tantum leviter uninervio; pappo brevissimo setuloso-coroniformi. — At the Frailes, about mid-height of the mountains above Batopilas, in shade under trees, *Palmer*, 255. The genus *AchætoGERON* is asserting itself as a necessity. The neutral rays of this species seem to be approximated by the preceding.

ACHÆTOGERON PINNATIFIDUS. Multicaulis e radice perenni, ultra-pedalis, pilis patentissimis undique hirsutus; foliis pinnatipartitis, segmentis linearibus rhachi æquilatis nunc latioribus sæpius integerrimis; involucri cinereo-hirsuto; ligulis perplurimis angustissime linearibus albis; acheniis compressis ovali-oblongis glabellis marginato-binervatis; pappo conspicuo coroniformi pluri-laciniato tertiæ parti longitudinis achenii adæquante. — On cool mountains west of Chihuahua, October, *Pringle*, 103. This is a true congener of *AchætoGERON Wislizeni*, Gray, which came from the same district in the mountains farther west, and has entire leaves. But it is so very like *EriGERON (PhalacroLoma) Neo-Mexicanus*, Gray, in aspect, although specifically different, as to suggest the union of these four species of

* *Psilactis asteroides*, Gray, Pl. Fendl., was collected by Palmer (410) north of Batopilas, therefore not very far from the station where Wislizenus found it, but in a more glandular and viscous form. *P. brevilungulata*, Schultz Bip., comes in Pringle's collection (14).

Achæoteron with the *Phalacrocoma* or *Polyactidium* section of *Eri-geron*. Yet it would be very inconvenient to include in the latter genus species which have no pappus-bristles. On the other hand, the ambiguous *A. Seemanni* seems to have rudimentary bristles.

ERIGERON (CÆNOTUS) INOPTATUS. Hirsutus: caule valido ultra-bipedali e basi ignota fastigiato- seu corymboso-ramosissimo; foliis laciniato-pinnatifidis vel parce inciso-dentatis, ramealibus sæpius integerrimis angusto-lanceolatis; capitulis subcymosis pedunculatis; involucri bracteis 2-3-seriatis subæquilongis lineari-lanceolatis acuminatis appressis, intimis scariosis; disco permultifloro cum receptaculo valde convexo; floribus fœmineis uniseriatis, ligula oblonga vel lineari stylum suum parum et flores hermaphroditos haud superante; achenis glabris; pappo e setis paucis corolla brevioribus albis barbellulatis caducis. — On river-bank in sand, 150 miles north of Batopilas, *Palmer*, 442. A coarse plant, of anomalous habit and character. Heads a quarter of an inch in diameter.

GNAPHALIUM PRINGLEI. Annum vel bienne, sesquipedale; foliis radicalibus spathulatis, caulinis lanceolatis acutiusculis (summis vix apiculatis) basi breviter adnato-decurrentibus subtus tenui-lanatis supra cum caule ramisque pube brevissima viscidula indutis; capitulis parvulis (lin. 2 longis) glomerato-cymosis; involuacro cylindraceo, bracteis albidis obtusiusculis, extimis angusto-oblongis, intimis linearibus. — Near Chihuahua, under cliffs, Oct., *Pringle*, 305.

LAGASCEA DECIPIENS, Hemsl. Biol. Centr.-Am. Bot. ii. 140, t. 44. San Miguel, near Batopilas, on the mountain-sides, *Palmer*, 145. "Compact shrubby plants, with abundance of golden-yellow blooms." The deep yellow color of the corollas is well preserved in the excellent dried specimens. The flowers of Seemann's plant were probably of the same color, but the specimens do not show it. In both, the upper part of the akene, as well as the pappus, is more or less villous.

GUARDIOLA TULOCARPUS, Gray, var. ARGUTA. Elatior e caudice perenni; foliis plerisque lanceolatis inæqualiter argute dentatis, quandoque modo *G. atriplicifoliæ* dente infimo utrinque protracto subhastatis; involuacro lin. 4-5 longo, fructifero ovoideo-fusiformi; floribus fœmineis achenisque nunc 2. — Rocky hills west of the city of Chihuahua, "growing in large clumps," *Pringle*, 678. The root is evidently perennial; but the foliage is too like that of *G. atriplicifolia*. — The North American *G. platyphylla*, Gray, was brought by *Palmer* (35) from the mountains south of Batopilas.

MELAMPODIUM LONGICORNU, Gray. The enclosing fructiferous bracts become strongly tuberculate in *Pringle's* Chihuahua specimens,

in those of Palmer (245), and hardly less so in those of Lemmon from S. Arizona. They are described in Syn. Fl. i.² 239 as "little tuberculate or smooth."

PARTHENIUM TOMENTOSUM, DC. Prodr. v. 332. River-bank, near Batopilas, *Palmer*, 123. "A large, bushy plant, 5 feet high," with leaves 7 or 8 inches long and a petiole of 2 inches. No pappus. Appears to agree well with DeCandolle's species, which comes, however, from the southern State of Oaxaca.

TRAGOCEROS MOCINIANUS. *T. zinnoides*, HBK., perquam similis; ligulis apice tantum bifidis haud fissilibus; costis achenii tuberculatis. — *Zinnia bicuspis*, DC. Prodr. v. 535, Mocino & Sessé, Ic. Fl. Mex. t. 573, in which the rude figure from which DeCandolle took the character "achæniis disci uniaristatis" was probably misapprehended. Bentham may with reason suspect that the described species should be reduced; and DeCandolle's two sections are probably of no account; for the tuberculation of the akenes does not appear on the well-grown ovary of the present plant, and in other genera this is a fallacious character. But inasmuch as this plant has not the divided and two-horned ligules of the original species, and has strongly tuberculate ribs, it may for the present be kept distinct. The larger heads and the long rays distinguish it from *T. Schiedeanus*. — Hills at San Jose, south of Batopilas, with "creamy white bloom," *Palmer*, 67.

ZALUZANIA DISCOIDEA. *Z. angustæ* et *Z. mollissimæ* vere congener, sed herbacea e rhizomatibus repentibus et ligulis nullis; pube minuta canescens; caule simplici 2–4-pedali e basi parum lignescente; foliis lato-ovatis brevi-petiolatis subintegerrimis amplis (sæpius 4-pollicaribus) supra glabratis viridulis subtus albo-tomentulosis; capitulis parvulis (lin. 3 altis) subglobosis plurimis in cymam nudam fastigiato-compositam digestis; involucro brevi adpresso canescente; corollis achenio brevioribus. — Along streams among the hills west of Chihuahua, *Pringle*, 309.

MONTANOA PATENS. Fruticosa, tenuiter puberula; caule orgyali laxè ramoso; ramis floridis gracilibus patentissimis capitula sparsim cymosa graciliter pedunculata gerentibus; foliis membranaceis acuminatis subserrulatis, caulinis (inferioribus haud visis) superioribus deltoideo-ovatis angulatim sub-3–5-lobatis juxta basim sæpe biauriculato-appendiculatam triplinerviis (poll. 4–5-longis et petiolo nudo sesquipollicari), ramorum ovato-lanceolatis subintegris; involucri bracteis angustis disco lin. 2–3 alto paullo brevioribus; ligulis 6–8 obovatis lin. 4–5 longis albis; paleis receptaculi per anthesin ovato-oblongis mucrone mox recurvo apiculatis, fructiferis maxime ampliatis charta-

ceo-scariosis obovato-cuneatis cucullatis glabris achenio pyriformi involventibus.—Shady places in the mountains above Batopilas, *Palmer*, 164. Character wholly from Dr. Palmer's specimens, in flower, and also some in fruit. But the species may probably include the plant collected by Seemann in the Sierra Madre of Durango, referred by Schultz Bip., Bot. Herald, 304, to his *Montagnea atriplicifolia*. Our specimen of this is incomplete, and it has larger ligules. Schultz was probably right in identifying *Verbesina atriplicifolia*, Juss., DC., and Colla, Hort. Rip. 144, t. 31, with *M. arborescens*, DC., but surely he is not to be followed in the making of a new name for it on account of this identification. A comparison with Colla's description and figure of *M. arborescens* (under the above-mentioned name) makes it clear that to this may be referred the *M. grandiflora*, Benth. Pl. Hartw. no. 134 (not of DC.), a species which comes nearest to *M. frutescens*.*

HELIANTHELLA PRINGLEI. Species singularis, hispidulo-scabrella; caulibus e caudice lignescente pluribus ultra-pedalibus ad apicem usque æqualiter foliosis; foliis ellipticis (circ. bipollicaribus siccitate chartaceis nitidulis) uninerviis venulosis basi parum angustata sessilibus; capitulo sat pedunculato ultra-semipollicari; involucro fere glabro, bracteis subulato-linearibus laxis, iis receptaculi chartaceis obtusis; ligulis lin. 7–8 longis linearibus; acheniis immaturis lineari-oblongis (extimis nunc 3–4-gonis) cano-villosis breviter biaristatis; squamellis intermediis aut nullis aut inter pilos achenii evanidis.—On rocky hills west of Chihuahua, Sept., *Pringle*, 646.

VERBESINA CHIHUAHUENSIS. *V. Wrightii*, Gray soror, gracilior, magis ramosa; foliis plerisque in petiolum attenuatis, aut omnibus lanceolatis dentato-incisis rariusve subintegerrimis alternis, aut inferioribus oppositis latioribus basi abruptis; capitulis parvulis (lin. 4 altis); involucro brevi laxiore; acheniis hirsutulis plerumque longiuscule biaristatis.—Santa Eulalia Mountains, near Chihuahua, on limestone, in cañons, *Pringle*, 657.

VERBESINA LEPTOCHÆTA. Inter *Pterophyta aptera*, *V. Wrightii* parum similis, frutescens; foliis oppositis serratis hispidulo-scabris triplinerviis, caulinis deltoideis (4–5-pollicaribus), ramealibus ovato-lanceolatis, omnibus in petiolum alato-marginatum subito decurrentibus; capitulis subsolitariis pedunculatis majusculis (ultra-semipolli-

* No. 585, Ghiesbreght, Chiapas, coll. 1864–70, referred to *M. arborescens* by Hemsley, probably through my wrong naming of a specimen sent from this herbarium to that of Kew, is a very different species; but before naming it one should compare the several species of Schultz published by Koch in *Wochenschr.* vii., here unknown.

caribus) multifloris; involucri laxi bracteis exterioribus herbaceis angusto-oblongis disco brevioribus patentissimis (demum deciduis), interioribus erectis membranaceis; floribus radii paucis styliferis sed sterilibus, ligula parvula lineari; acheniis disci elongato-oblongis angusto-alatis nunc subalatis lin. 3-4 longis aristis pappi 2 gracilibus vix duplo longioribus. — Near Batopilas, *Palmer*, 170. "A bushy plant, sunflower-like, 5 to 8 feet high," the branches herbaceous, but at least frutescent below; stems not at all wing-margined.

VERBESINA CYMOSA. *Verbesinaria*, e grege *V. arborea*, fruticosa, ultra-orgyalis, tomentulosa; ramis foliosis exalatis cyma composita corymbiformi polycephala aperta terminatis; foliis oppositis lanceolatis utrinque attenuatis serrulatis penninerviis (6-9 poll. longis cum petiolo brevi) supra hispidulo-scabris subtus canescenti-sericeis; capitulis pedicellatis angusto-oblongis 7-9-floris; involucre duplici, nempe e bracteis 8-9 lanceolatis obtusiusculis viridulis erectis biseriatim imbricatis disco dimidio brevioribus et totidem tenuioribus lineari-oblongis flavescentibus flores subæquantibus paleis receptaculi referentibus; acheniis ignotis; ovario brevi obovato biaristato; aristis filiformibus sed obcompressis puberulis corolla paullo brevioribus. — Mountain ravines near Batopilas, "upright, many-stemmed, 8 feet high, with golden-yellow blossoms," *Palmer*, 135.

BIDENS LUDENS. *Psilocarpæa*, annua, glabra; caule bipedali ramoso corymboso-floribundo; foliis tenuibus bipinnatifartitis, lobis linearibus; involucre campanulato (lin. 2-3 alto), bracteis exterioribus patentibus linearibus vel lineari-spathulatis hirtello-ciliatis; ligulis (neutris) conspicuis ovalibus (lin. 3 longis) aureis; acheniis hirtello-scabris tetragonis heteromorphis, extimis obovato-clavatis sesquilinearibus calvis, interioribus sensim longioribus angustioribus, intimis (lin. 3 longis) fere linearibus basi apiceque parum attenuatis aut calvis aut breviter biaristatis, aristis subulatis versus apicem setis 2-4 validis retrorsis (persistentibus vel deciduis!) barbatis. — Cool hillsides and along streams, northwest of the city of Chihuahua, *Pringle*, 293, very sparingly collected.

LEPTOSYNE (COREOCARPUS) ARIZONICA, Gray, Proc. Am. Acad. xvii. 218, & Syn. Fl. i.² 301. Found on the mountains behind Batopilas, at about 7,000 feet, *Palmer*, 294.

TRIDAX ERECTA. Hispida vel hispidula; caule erecto paniculatim ramoso e radice annua (nec modo peraffinis *T. procumbentis* procumbente e radice perenni), ultrapedalis; foliis membranaceis aut ovalibus dentatis aut dilatatis trifidis, lobis denticulatis rariter incis; ligulis brevibus saturate luteis; paleis receptaculi costa excurrente aristatis;

pappo e setis 20 longe plumosis corolla disci dimidio achenio paullo brevioribus. — Among rocks midway on the mountains above Batopilas, *Palmer*, 285.

TRIDAX BICOLOR, Gray, Pl. Fendl. 104. Mountain-sides above Batopilas, *Palmer*, 130. Rays bright white (disk yellow): but specimens of Pringle (638), from near the city of Chihuahua, have the rays tinged with rose. Both are larger-leaved than the original specimen of coll. Wislizenus.

TRIDAX LEPTOPHYLLA. Parce hispidula; caule (e radice annua?) erecto patenti-ramoso pedali; ramis superne longe nudis monocephalis; foliis ternato-nunc biternato-partitis in segmenta angusto-linearia elongata integerrima, summis nunc integris fere filiformibus; capitulis multifloris; disco fructifero fere conico (semipollicari); involucri lato-campanulato, bracteis ovalibus vel orbiculatis membranaceis purpurascenscentibus glabris; paleis receptaculi demum alte conici muticis; ligulis rotundato-quadratis tubo suo villosa subduplo longioribus discisque corollis aureis; pappi setis rigidis breviter plumosis achenio turbinato æquilongis. — Sandbars of the river near Batopilas, *Palmer*, 425.

PERITYLE MICROCEPHALA. Cinereo-puberula, e radice forte annua ramosissima, diffusa, floribunda; foliis omnibus oppositis deltoideis seu dilatato-ovatis basi truncatis grosse paucidentatis repandisve (lin. 4–8 longis); capitulis subcymosis (lin. 2 altis); involucri late campanulati bracteis oblongis; ligulis albis quadratis lineam longis; corollis disci brevibus; styli fl. herm. ramis cono subulato terminatis; acheniis oblongis marginibus dense villosis; pappo coroniformi sat conspicuo sæpius cum aristellis 1–2 tenuibus nudis achenio circiter dimidio brevioribus. — Rocky hills near the city of Chihuahua, Oct. 8, just coming into blossom, *Pringle*, 571 (too scanty for distribution*), and mountains above Batopilas late in October, with mature akenes, *Palmer*, 268. The delicate awns of the pappus under the lens are either quite smooth or occasionally with one or two denticulations.

BAHIA NEO-MEXICANA, Gray, Proc. Am. Acad. xix. 27, & Syn. Fl. i.² 333. North of Batopilas, *Palmer*, 399; also coll. by *Pringle*.

SCHKUHRIA WISLIZENI, Gray, Pl. Fendl. 96. About 150 miles north of Batopilas (therefore not far from where it was discovered by Wislizenus), *Palmer*, 387. A larger and much-branched form.

HYMENOTHRIX PALMERI. Ultrapedalis e radice forte annua, subglabra; foliis ternatipartitis et segmentis subpinnatipartitis in lobos 3–7 angusto-lineares integerrimos, summis parvulis trifidis; inflores-

* The rare *Perityle Parryi*, Gray, is, however, in Pringle's distribution, 183.

centia generis; capitulis hemisphæricis multifloris; involucri bracteis flavo tinctis; ligulis nullis; corollis flavis, lobis ovatis fauce lato-campanulata æquilongis; acheniis obpyramidatis acutissime 4-5-gonis, angulis villosissimis; pappo corolla et achenio brevior insigniter paleaceo, nempe e paleis 12 lato-lanceolatis oblongisve costa valida excurrente aristellatis vel fl. exteriorum quandoque muticis. — In the mountainous district 150 miles north of Batopilas, *Palmer*, 395. A very interesting species in that it seems to connect the rayless *H. Wrightii* with the radiate and yellow-flowered *H. Wislizeni*; but not so welcome in that the paleaceous and only awn-tipped rays of the pappus indicate an approach to *Bahia*. The corolla and involucre, however, are truly of *Hymenothrix*.

POROPHYLLUM SEEMANNI, Schultz Bip. in Seem. Bot. Herald, 308. Near Batopilas, *Palmer*, 216.

TAGETES WISLIZENI, Gray, Pl. Fendl. 92. *Leptocephalæ*, spithamæa ad pedalem e radice annua; ramis gracilibus patentibus uni-paucifloris; pedunculis capitulo parum longioribus; foliis pinnatisectis, segmentis 7-13 (haud ultra-semipollicaribus summis confluentibus) anguste-lanceolatis acutis inciso-dentatis, dentibus acutis muticis foliorum suprem. parvulorum tantum setiferis; involucri fusiformi semipollicari 4-5-dentato 8-12-floro; ligulis 2-4 rotundatis lineam longis; pappo e paleis 1-2 sensim subulato-aristatis achenio æquilongis totidemque truncatis dimidio brevioribus, omnibus sæpius tubuloso-concretis. — On the mountains at about 7,000 feet, half-way between Batopilas, and on the *Cumbre* or summit, *Palmer*, 267. The specimen of *Wislizenus* is depauperate. In Proc. Am. Acad. xix. 43, I have cited it under *T. subulata*, the *T. multiseta* of DeCandolle. But now the present good specimens show that the leaves are none of them bipinnately dissected, and only the bracteiform ones are setiferous.

TAGETES PALMERI. Perennis; caule quadripedali ramoso inferne frutescente; ramis ad apicem usque foliosis; foliis pinnatisectis, segmentis angustis lanceolatis sensim acuminatis acutissime serrulatis (poll. 1-2 longis, imis cum paucis hinc inde interjectis parvis subsetiferis); pedunculis corymboso-fastigiatis ultra-pollicaribus inferne gracilibus sursum crassioribus; involucri multifloro lato-campanulato (vix ultra lin. 3 alto) 8-10-dentato disco brevior; ligulis 5-8 obovato-oblongis emarginatis semipollicaribus croceis; pappo e paleis sæpius 2 subulatis aristiformibus cum 2-3 brevibus quadratis truncatis. — Same habitat as the preceding, "near a spring, very showy and many-flowered," *Palmer*, 267. To be associated with *T. Parryi* and *T. Lemmonii* rather than with *T. patula*.

PECTIS BERLANDIERI, DC.? var. PALMERI. Pedunculis sparsis longioribus quandoque pollicaribus; pappi setis 2-3. — South of Batopilas, *Palmer*, 61.

PECTIS STENOPHYLLA. *Pectothrix*, *P. longipedi* quoad flores per-similis, e basi suffrutescente ramosissima, diffusa, subpedalis; ramis gracillimis foliosis; foliis angustissime linearibus tenuibus; pedunculis capillaribus sesquipollicaribus; involucro (lin. 2 alto) angusto circa 8-phylo 15-18-floro; ligulis 8. — Hillsides near Batopilas, *Palmer*, 81. Pappus of *P. longipes*, or the awns of the ray-flowers stouter.

ARTEMISIA REDOLENS. *Dracunculus*, e radice perenni ultrapedalis, quoad sureulos radicales cano-tomentulosa, cæterum viridis glabella vel glabra; foliis tenuibus 3-5-partitis in segmenta linearia (vix ultra-semi-pollicaria) subintegra; capitulis sesquilineam longis paniculatis erectis; involucro glabro; acheniis pallidis opacis costato-striatis. — Chihuahua, on cool slopes under cliffs, *Pringle*, 296. Bears some resemblance to *A. dracunculoides*; "has a powerful odor like that of *A. Absinthium*, but stronger, which burdens the air of the whole hillside."

SENECIO HARTWEGI, Benth. Pl. Hartw. 18; Gray, Syn. Fl. i.² 386. Mountainous district, 150 miles north of Batopilas (therefore not far from where it was collected by Wislizenus), *Palmer*, 366.

PEREZIA PLATYPHYLLA, Gray, Pl. Fendl. 111, & Proc. Am. Acad. xix. 61. Santa Eulalia Mountains, Chihuahua, *Pringle*, 583. At Yerba Buena, Chihuahua, about 7,000 feet above the sea, *Palmer*, 299. The round leaves maintain the character of the species, as founded on the specimen gathered by Wislizenus in this region.

PEREZIA THURBERI, Gray, Mem. Am. Acad. v. 324, & Syn. Fl. i.² 409. Rocky hills near Batopilas, *Palmer*, 212.

PEREZIA PANICULATA. Scabrido-puberula; caule elato ramoso; foliis (inferioribus ignotis) chartaceo-membranaceis (3-4-pollicaribus) lanceolatis acutis deorsum angustatis basi acutis subsessilibus penni-nerviis venuloso-reticulatis subintegerrimis; panicula floribunda laxa; capitulis pro genere parvis; involucro campanulato (lin. 2-3 longo) 10-12-floro, bracteis 3-4-seriatim imbricatis coriaceis acutis vel apicu-latis margine villosulis, versus apicem viridibus vel purpureo tinctis, extimis ovatis, intimis lineari-oblongis. — Mountains above Batopilas, at the Frailes, about 7,000 feet above sea level, *Palmer*, 279.

Lobeliaceæ.

LOBELIA GRACILENS. *L. gruinæ*, Cav. proxima; radicibus fascicu-latis incrassatis; caulibus 1-2-pedalibus gracillimis; foliis radicalibus rosulatis angusto-spathulatis (pollicaribus), caulinis linearibus angustis-

simis integerrimis, summis filiformibus; floribus paucis in racemo laxo longe pedicellatis; corolla cærulea majuscula, lobis labii majoris semipollicaribus oblongis tubo parum longioribus. — Grassy places, on the summit of the mountains above Batopilas, at about 8,850 feet, *Palmer*, 360. No. 29 of Coulter's Mexican collection is probably a larger-leaved form of this species, but my specimen is insufficient.

Apocynaceæ.

PLUMERIA MEXICANA, Lodd. Bot. Cab. t. 1024? *P. Lambertiana*, Lindl. Bot. Reg. t. 1378? *P. mollis*, Benth. Pl. Hartw. 24, non HBK. — "Trunk erect, 10 or 15 feet high, 6 inches in diameter, with few short and stiff branches." Rocky hillsides, near Batopilas, *Palmer*, 231. This cannot be *P. mollis*, HBK., from the Orinoco, which is said to have a repent or prostrate trunk, and the leaves pubescent beneath. Hartweg's specimens are in blossom, Palmer's in fruit, with follicles terete and slender, half a foot long. Body of the seed half an inch long, thin, extended downwardly (toward base of follicle) into thin wing of nearly an inch in length. With our present knowledge it is better to take these names as of one species, and to adopt the oldest name.

TABERNÆMONTANA ———. Allied to *T. littoralis*, HBK., or at least to no. 2222 of Bourgeau's coll. at Cordoba, but thinner-leaved. In fruit only. Follicles globose-ovate, inch and a half long, with evidently fleshy epicarp, dehiscent, very many-seeded. Seeds enclosed in a scarlet arilliform pulp, the firm and elongated-oblong body 4 lines long, lightly striate; albumen ruminant at the surface. — In ravines near Batopilas: "a large loose-growing shrub, with dark green foliage, said to be poisonous," *Palmer*, *M.*

TRACHELOSPERMUM STANS. Fruticulus erectus, bi-tripedalis; foliis fere *T. difformis*; pedunculis brevioribus; floribus haud visis. — Near the city of Chihuahua, under cliffs, *Pringle*, 640. One would expect the *T. difforme* collected at Monterey to be the same, but that is twining, and seems to be the United States species.

Asclepiadaceæ.

PHILIBERTIA PALMERI. Inter *P. elegantem* et *P. viminalem* quasi media, tenuiter puberula, volubilis; foliis (plerumque pollicaribus) oblongis apiculato-acuminatis basi rotundatis vel obtusis brevipetiolatis; pedunculis foliis umbellaque multiflora ter longioribus; corollæ albæ suaveolentis lobis obtusissimis lin. 3 longis; corona exteriore annulato conspicuo, interiore peraffinium. — Banks of

streams near Batopilas, climbing over bushes, *Palmer*, 5. Has the long peduncles and nearly the foliage of *P. viminalis*, but a minute pubescence, and the exterior crown much more manifest. The gravid ovary is ovate and densely canescent-tomentose. But a follicle accompanying our specimen is slender-fusiform and glabrous.

PHILIBERTIA ELEGANS, Gray, Syn. Fl. ii.¹ 87, under *P. Torreyi*. The latter species is distinguished from the former, not so much by the characters assigned in the work cited as by the very much thickened pieces of the inner corona. The specimens of *P. elegans* collected by *Pringle* in Chihuahua are very pubescent, and the umbels many-flowered. The divisions or scales of the inner crown in this species, when fresh or freshened by soaking, are seen to be "rotund," as described by *Decaisne*, pointless, and decidedly flat. The peduncles vary in length, are sometimes short, but never much longer than the pedicels. *P. bicolor* (*Sarcostemma bicolor*, *Decaisne*), which *Hemsley* unites with *P. elegans*, may be a variety of it; but it has, as described, sessile umbels and scales of the inner corona ovate with an acumination. With this agrees *Bourgeau's* no. 318 from Santa Fé in the valley of Mexico, except that these scales are only mucronate-apiculate; also *Schaffner's* no. 640, in which they are less apiculate.

PHILIBERTIA BILOBA, the *Sarcostemma bilobum*, *Hook. & Arn.* Bot. Beech. 438, has probably been wrongly suppressed in *Hemsley*, Biol. Centr.-Am. Bot. ii. 318, although he should have had the original at hand. It comes from Acapulco only, and is said to have the divisions of the staminal crown ovato-triangular. Those of *P. cynanchoides* (of widely different habitat) are broadly oval, very obtuse and turgid. The following, from the eastern side of Mexico, may be more like *P. biloba*.

PHILIBERTIA ERVENDBERGII. Volubilis, undique puberula; foliis ovato-cordatis (sinu aperto lobis rotundatis) tenuiter acuminatis parum sesquipollicaribus; umbellis pedunculatis; corollæ glabellæ lobis ovato-ellipticis obtusis (lin. 3-4 longis) viridulis intus linea purpurea notatis mox reflexis; corona exteriore annulari conspicua gynostegium fere lineam longum æquante, interiore e squamis crassiusculis verticalibus latissime oblique ovatis apice libero acutiusculis antheris parum brevioribus. — *Sarcostemma elegans*, Gray, Proc. Am. Acad. v. 187. — *Wartenberg*, near Tantoyuca, Mexico, *Ervendberg*, coll. no. 174. The following species also appears to be new:—

PHILIBERTIA FENDLERI. Volubilis, fere glabra; foliis sinu angusto profundo cordatis ovatis subito acuminatis (2-3-pollicaribus); pedunculo pedicellisue umbellæ multifloræ elongatis; corollæ fere

glabræ lobis oblongis (lin. 4 longis) pallidis mox reflexis; corona exteriore annulari margine tenui integerrimo gynostegium fere lineam longum æquante, interiore e squamis crassis rotundo-ovalibus antheris parallelis basi earum adnatis discum stigmatis paullulum superantibus. — Tovar, Venezuela, *Fendler*, coll. no. 2119.

METASTELMA PRINGLEI, n. sp. Rocky hills around Chihuahua, *Pringle*, 62. Species nearest *M. Chicxense*. — In the subjoined footnote I have attempted to characterize the known species of Mexico and the United States.*

* **METASTELMA**, R. Br. Species Am. Bor. et Mex.

Schlechtendal's *Irmishia* (*floribunda*), with its large leaves, compound cymes, and structure of flower not wholly clear, is probably not of this genus, and so ought not to give the name of Bentham and Hooker's first section. Nor are their three sections very definitely marked. *M. pedunculare*, Decaisne, attributed to Mexico by him, was of the Guatemalan part of Hartweg's collection. In all the following species known to us, (except perhaps the first, which is variable,) the peduncles are short, often very short or nearly short.

- * Columna (i. e. tubus stamineus) elongata, coronam sub antheris gerens: corolla campanulata 5-fida. — § *Epicion*, Griseb.

M. BAHAMENSE, Griseb. Cat. Cub. 174; Gray, Syn. Fl. ii. 101. — Florida. (Bahamas.)

- * * Columna manifesta sed brevis, coronam juxta antheras gerens: corolla 5-partita, imberbis, lineam longa.

M. SCHAFFNERI. Glabrum, tenue; foliis lanceolatis basi obtusis; calycis lobis subulatis; corollæ subquinquepartitæ lobis oblongo-ovatis crassiusculis intus tantum puberulis; columna antheris subæquilonga; coronæ squamis lineari-subulatis discum stigmatis superantibus. — *Metastelma Palmeri*, Watson, Proc. Am. Acad. xviii. 115, quoad pl. Schaffner. — Mexico, near San Luis Potosi, *Schaffner*, part of no. 652, misprinted 635 in Proc. Am. Acad. l. c.

M. ANGUSTIFOLIUM, Turcz. Præter caules striolatos lineato-puberulos pediculusque glabrum; foliis lineari-lanceolatis basi acutis; calycis lobis ovatis; corollæ profunde quinquepartitæ prorsus glabræ lobis ovatis; columna brevissima; coronæ squamis lato-ovatis subito acuminatis membranaceis contiguis antheras æquantibus. — Bull. Soc. Nat. Mosc., 1852, ii. 15, & Flora, 1853, 721, ex char. *M. Palmeri*, Watson, l. c., as to pl. Bourgeau. — Mexico, *Linden*, no. 1353. *Bourgeau*, no. 627.

- * * * Columna nulla vel brevis: corona ad juncturam andrœcii et corollæ 5-partitæ inserta.

← Corolla haud ultra sesquilineam longa, intus glabella, minute cano-papillosa vel puberula, nunquam villosa-pubescent: herbæ glabræ.

↔ *Angustifolia*.

M. PALMERI, Watson, pro parte. Foliis angusto-lanceolatis basi acutiusculis vel obtusis: calycis lobis ovatis obtusis; corollæ lobis oblongis seu oblongo-lanceolatis; coronæ squamis lanceolatis acuminatis vel ovato-subulatis discum

GONOLOBUS PETIOLARIS. Subvolubilis, e basi frutescente 2-3-pedalis, parce hirsutus; foliis tantum pubescentibus membranaceis oblongo-cordatis acuminatis sesqui-tripollicaribus et petiolo æquilongi; pedunculis petiolo haud longioribus laxè plurifloris; sepalis lanceolatis (lin. 2 longis); corolla aut fusco-purpurascens aut "alba" rotata 5-partita glabra lævique haud incrassata, lobis lanceolatis (adultis vix semipollicaribus); corona simplici subcarnosa crateriformi vix quinqueloba truncata; folliculi desunt. — Margins of ravines, &c., near Batopilas, *Palmer*, 7, 208.

planum stigmatis paullo superantibus. — Gray, Syn. Fl. ii. 403. *M. Palmeri* (quoad pl. *Palmer*, no. 824) & *M. Californicum* (pl. *Palmer*, 828), Watson, Proc. Am. Acad. xviii. 115. — Southern borders of Texas, at Laredo, *Palmer*, and farther westward in Kimble Co., *Reverchon*. Also, adjacent Mexico, in mountains south of Monclova, *Palmer*.

++ ++ Latifolia.

M. CALIFORNICUM, Benth. Bot. Sulph. 33, t. 18. — Bay of Magdalena, Lower California, *Hinds*. Not since collected; said to be similar to the next, the ovate-oblong leaves commonly subcordate, the corolla in bud globular and its lobes broadly ovate; and the lanceolate scales of the corona little surpassing the stigma.

M. PARVIFLORUM, R. Br., of the West Indies, has been cited from Mexico: if so, it must belong to the coast districts. *M. Fraseri*, Decaisne in DC. Prodr. viii. 513, may belong here. It was described from a specimen in Bentham's herbarium, received from that of Forsyth, and thought perhaps to come from Carolina, but most probably from the West Indies.

+ + Corolla lin. 1-2 longa, lobis intus pubescentibus vel villosis: folia lanceolata et linearia.

M. CHIAPENSE. Vix volubile, fere glabrum; foliis linearibus acuminatis vel acutatis (lin. 6-12 longis 1-1½ latis) basi subacutis, superioribus cymulas subsessiles 3-6-floras paullo superantibus: calycis lobis ovatis obtusis: corolla in alabastro ovoidea (lineam longa), lobis ovatis acutiusculis crassiusculis intus crebre breviter pubescentibus; columna vix ulla; coronæ squamis angustissime linearibus corollæ lobis tertia parte brevioribus vertice stigmatis pyramidato emarginato adæquantibus. — *M. Cubense*? Hemsl. Biol. Centr.-Am. Bot. ii. 327, non Decaisne. *M. Palmeri*, Watson, l. c., quoad pl. Ghiesbreght. — On arid mountains, in Chiapas, S. Mexico, *Ghiesbreght*, no. 664.

M. PRINGLEI. Vix volubile, humile, glabrum; foliis lanceolatis nunc lineariblongis acutis vel obtusis mucronatis (lin. 6-12 longis 2-3 latis) basi rotundatis vel retusis cymulas subsessiles 2-5-floras superantibus; calycis lobis oblongis obtusis; corolla in alabastro oblongo-ovoidea (sesquilineam longa), lobis angustoblongis intus retrorsum denseque villosopubescentibus; columna brevissima; coronæ squamis fere filiformibus acutatis corollæ lobis paullo brevioribus discum convexum stigmatis longius superantibus. — Chihuahua, N. Mexico, *Pringle*, no. 62. Vide supra.

M. ARIZONICUM, Gray. Volubile, puberulum, basi lignescens; ramis rigi-

GONOLOBUS STENOPETALUS. *G. obliquo* peraffinis, multo humilior, pedalis ad orgyalem e basi lignosa, primum erecta, parum volubilis, hispidior; foliis profunde cordatis subito-acuminatis 2-4-pollicaribus et petiolo fere æquilongo; cymis plurifloris cum pedunculo brevi petiolo brevioribus; calyce hispidulo; corolla glabra vel extus glabriuscula virido-purpurea 5-partita, segmentis lineari-ligulatis ($\frac{1}{3}$ - $\frac{1}{2}$ -pollicaribus); corona antheris brevior atropurpurea annuliformi carnosa 5-lobata, lobis crassis (apice brevi inflexis) subglobosis; folliculis turgido-ovatis brevi-acuminatis hirsutulis muriculatis; seminibus haud comosis! — Shaded and rocky hills near Chihuahua, *Pringle*, 55, 696.

GONOLOBUS CHIHUAHUENSIS. Facies omnino *Chthamaliæ*, corona simplici *Eugonolobi*, procumbenti-diffusus, nec volubilis, undique hirsutus; caulibus subpedalibus foliosissimis; foliis ovatis subcordatis acutis (haud ultrapollicaribus) petiolatis margine sæpius undulato-crispis; pedunculo 1-3-floro folium æquante; corolla (purpurascente) glabra 5-partita, lobis oblongis lin. 2 longis tenuiter nervosis et versus apicem reticulatis; corona brevi patelliformi margine lobis 5 angustissime linearibus puberulis antheris crassiusculis oppositis super eumque incumbentibus instructis; folliculis turgido-ovatis acuminatis hirsutulis muricatis. — On hills and mesas around the city of Chihuahua, *Prin-*

dulis; foliis crassiusculis nunc angusto- nunc oblongo-linearibus; floribus ob pedunculum pedicellosque brevissimos in axillis glomeratis; calycis lobis subulatis rigidulis corolla dimidio brevioribus; corollæ profunde 5-partite lobis crassiusculis lineari-lanceolatis intus creberrime villosopubescentibus; coronæ squamis lineari-subulatis discum umbonatum stigmatibus paullo superantibus. — Proc. Am. Acad. xix. 85, & Syn. Fl. ii. 403. — S. Arizona, near Tucson, *Pringle*.

M. BLODGETTII, Gray. Volubilis, glabrum; caulibus filiformibus; foliis tenuioribus angustissime lanceolatis; floribus pedicellatis in cymula 1-5-flora laxa brevipedunculata; calycis lobis ovatis brevibus; corollæ lobis lineari-lanceolatis intus basi nudis supra medium hirsutulo-barbatis; coronæ squamis lineari-subulatis discum stigmatibus æquantibus. — Proc. Am. Acad. xii. 73, & Syn. Fl. ii. 101. *M. parviflorum*, Chapm. Fl. 367, non R. Br.

+ + + Corolla lin. 2-3 longa, profunde 5-partita, lobis linearibus intus creberrime villosopubescentibus: folia ovato-oblonga seu lanceolata coronæ squamæ attenuato-subulatæ.

M. BARBIGERUM, Scheele in Linnæa, xxi. 760, &c. — Texas; first coll. by *Berlandier*.

* * * * Columna antheris æquilonga, nuda: corona (e squamis angustissime linearibus) basi corollæ fere 5-partitæ inserta: folia ovato-oblonga.

M. SCHLECHTENDALII, Decaisne. Said to be Mexican as well as West Indian. The original was from St. Thomas, and has been recently distributed by Eggers.

gle, 104, 692. In habit between *G. parviflorus* and *G. pedunculatus*. But the crown is perfectly simple, with no internal crests or appendages, the margin abruptly produced into the five narrow and entire lobes which overtop the anthers, these of the firm texture which is common in the *Chthamalia* section, of which this species has wholly the aspect.

GONOLOBUS CAUDATUS. *Eugonolobus* quoad flores, habitu alieno, subglaber, suffruticoso-multicaulis e radice crassa; caulibus erectis vel subdiffusis ramosis foliosissimis; foliis e basi latiuscula nunc cuneata nunc truncata lanceolatis caudato-acuminatis infra medium undulatis pollicaribus, petiolo submarginato lin. 2-4 longo; pedunculis solitariis binisve brevissimis unifloris; sepalis linearibus; corolla rotata atrofusca crassiuscula 5-partita glabra, lobis lanceolato-subulatis (lin. 2 longis) eveniis; corona simplici annulari subcrateriformi carnosio integro discum stigmatis cingente: folliculi desunt. — Gravelly soil, on the hacienda San José, about 25 miles south of Batopilas, *Palmer*, 75. The corona is quite entire or obscurely undulate, and has no internal appendages except perhaps five obscure lamellæ connecting it with the under side of the sessile stigma-disk.

GONOLOBUS (CHTHAMALIA) ACUMINATUS. *G. productus*, Torr., peraffinis; foliis pariter protracto-acuminatis atque folliculo (glaberrimo) longissime acuminato; corolla extus majus pubescente, fauce villosula; corona antheras superante 5-partita membranacea, lobis quasi ovato-quadratis apice lato-truncatis intus medio ligula brevissima ovata auctis (antheris haud adnatis). — Near Bachimba, 40 miles south of the city of Chihuahua, *Pringle*, 56. In some specimens of *G. productus* there is very slight adhesion of the lamellæ or ligulæ of the crown to the column under the anthers.

GONOLOBUS (CHTHAMALIA) SCHAFFNERI, Gray in Hemsl. Biol. Centr.-Am. Bot. ii. 334, and *G. bifidus*, Hemsl. l. c. 330, are manifestly the same species. The two names being of the same date, the first is rather to be preferred: the second is less appropriate, because the long ligules of the inner crown are not “bifid,” except at the tip, perhaps not always even there.

PHEROTRICHIS, Decaisne, gen. *Asclep.*-*Gonolobearum* restitutum.

Calyx a basi 5-partitus, segmentis lanceolatis: glandulæ sinibus oppositæ solitariae. Corolla campanulata, ultra medium 5-fida, crassiuscula: lobi in alabastro leviter contorto-obtegentes, ovati, intus pilis longis crebris primum retrorsis et medium versus inflexis comato-villosissimi, demum rotato-patentes. Corona ad juncturam columnæ brevis-

simæ et corollæ inserta, simplex, e squamis 5 planis obovato-quadratis apice exciso-truncatis constans, antheras superans. Antheræ tribi, sed prominentes, subcoriaceæ, latissimæ, stigmatis discum haud explanatum brevissime superantes, membrana oblonga tenui hyalina superatæ. Pollinia oblonga, horizontalia, curvula. Stigma umbone terminatum. Folliculi ovato-fusiformes. — Herbæ humiles, omnino erectæ, e radice crassa fusiformi vel tuberosa perennes, hirsutæ, foliosæ; foliis oppositis (paucisve alternis) oblongis utrinque obtusis penninerviis, imis nunc cordatis; floribus ad axillas umbellato-congestis, pedunculo brevissimo vel nullo. — *Pherotrichis*, Decaisne in Ann. Sci. Nat. ser. 2, ix. 322, & Endl. Gen. 1798; Gray, Syn. Fl. ii. (ed. 2), 462. *Lachnostomatis* sp., Decaisne in DC. Prodr. viii. 602.

P. BALBISH. Fusco-hirta; corollæ lobis acutiusculis intus sub lana venoso-reticulatis; coronæ squamis umbone angusto-conico stigmatis adæquantibus, apice latissime exciso quasi bilobo. — *Asclepias villosa*, Balbi in Mem. Acad. Turin, vii. 331, t. 4. *Cynanchum villosum*, Rœm. & Schult. Syst. vi. 103. *Pherotrichis*, Decaisne, l. c. *Gonolobus pogonanthus*, Hemsl. Biol. Centr.-Am. Bot. ii. 333, quoad pl. Ghiesbreght. — Plant as to the original of the Turin Garden of unknown origin, but evidently the same as Ghiesbreght's no. 670, from Chiapas, S. Mexico. The umbo which surmounts the stigma is longer than all the rest of the gyno-andræcium, but is narrower at base than the disk which supports it. Balbi figures the follicles, which accord with those of the following species, and show some of the hairs which probably equally cover it when young.

P. SCHAFFNERI. Minus hirsuta; corollæ lobis obtusis, venis usque ad apicem nerviformibus simpliciusculis; coronæ squamis umbone maximo stigmatis subgloboso brevioribus, apicis truncati angulis vix productis; folliculis fusco-hirsutis demum glabrescentibus. — *Gonolobus pogonanthus*, Hemsl. l. c., quoad pl. Parry & Palmer. — San Luis Potosi, Northern Mexico, Schaffner, 63, Parry & Palmer, 586. S. W. Arizona, near Fort Huachuca, Lemmon, 2816.

This genus, which Decaisne partially indicated and afterwards suppressed, being now luckily identified and two species indicated, well merits restoration. It is certainly nearer to *Lachnostoma*, HBK., than to any part of *Gonolobus*. Yet the crown is not upon the corolla, as in the former genus, the very strongly bearded corolla-lobes and the stigma are quite peculiar, and moreover the plants are strictly erect, with the habit of *Asclepias* or *Acerates*. The anthers are appendaged with a distinct hyaline tip, which, however, would easily be overlooked.

Gentianaceæ.

GENTIANA LANCEOLATA, Griseb. in DC. Prodr. ix. 102. Grassy places in wet soil, on the mountain summits above Batopilas, at 8850 feet, *Palmer*, 361. A slender form, often simple-stemmed and one-flowered, from an annual root. Seed-coat minutely squamulose.

GENTIANA WISLIZENI, Engelm. Trans. Acad. St. Louis, ii. 215, t. 7. Same habitat as the preceding, *Palmer*, 334. Accords with the plant of *Wislizenus*.

GENTIANA WRIGHTII, Gray, Syn. Fl. ii. 118. Near Yerba Buena, at about 7,000 feet; the handsome white flowers with a yellowish tinge, *Palmer*, 306.

GENTIANA ADSURGENS, Cervantes in Griseb. Gent. 286. *G. angustifolia*, Hemsl. Biol. Centr.-Am. Bot. ii. 350, not Michx. Wet places on the mountain summits, at 8,850 feet, *Palmer*, 335. Apparently a common species in Mexico.

HALENIA PARVIFLORA, Don, answering to the var. *latifolia*, the short lower leaves being oval, which probably is the usual condition.* Mountainous country, 150 miles north of Batopilas, *Palmer*, 403.

HALENIA PALMERI. Pedalis, striata, thyrsoido-pluriflora; foliis omnibus angusto-linearibus sub-uninerviis nonnullisve inferioribus sub-spathulatis fere trinerviis; floribus 4-meris semipollicaribus; sepalis lineari-lanceolatis; corollæ luteæ calcaribus pendulis subincurvis tenuisubulatis lin. 2-3 longis; capsula ultra-semipollicari. — Mountain summits above Batopilas, at 8,850 feet, *Palmer*, 359.

Polemoniaceæ.

GILIA FLORIBUNDA. Gray, Proc. Am. Acad. viii. 267. A condensed form, 150 miles north of Batopilas, *Palmer*, 398. Not before reported from Mexico.

GILIA PRINGLEI. *Ipomopsis*, sec. Gray, Syn. Fl. ii. (ed. 2), 410, inter *G. Thurberi* et *G. Macombii*. Perennis basi suffrutescente; foliis fere omnibus pinnatipartitis segmentis rhachique filiformibus mollibus; glomerulis florum laxiusculis; calycis lobis aristato-acuminatis; corolla pollicari violaceo-purpurea, tubo sursum sensim ampliato, lobis ovatis vel oblongis insigniter subulato-acuminatis; staminibus inæqualiter insertis fauce subinclusis, filamentis anthera oblonga haud

* Ghiesbreght's no. 137 (we have not 618), referred to *H. parviflora* by Hemsl. with narrow linear leaves throughout, appears to be identical with the Quitensian *H. brevicornis*, Don.

longioribus: ovarii loculis 5-6-ovulatis; capsula calyce paullo brevior. — Hillsides west of the city of Chihuahua, Oct., *Pringle*, 559. Also W. Chihuahua about 150 miles north of Batopilas, *Palmer*, 431.

Convolvulaceæ.

JACQUEMONTIA PRINGLEI, Gray, Syn. Fl. ii. 434, var. GLABRESCENS. — Trailing or climbing over bushes, white-flowered, near Batopilas, *Palmer*, 107, 248. Appears to be essentially like the greener and glabrescent form of *J. Pringlei*, as collected by Pringle and also by Lemmon on the Mexican borders of Arizona; but somewhat larger-leaved, and the climbing form with rather many-flowered peduncles. Probably the genus were better merged in *Convolvulus*.

Solanaceæ.

PHYSALIS MICROPHYSA. Species singularis corolla per anthesin plano-rotata *P. lobata*, tamen calyce fructifero exangulato, pube simplicis brevi parum viscida pubescens; caulibus pedalibus e radice perenni gracilibus paniculato-ramosis; foliis parvis (semipollicaribus) crenato-repandis, caulinis subrotundis pl. m. cordatis, ramealibus ovatis longiuscule petiolatis, floralibus diminutis; pedicellis calyce brevioribus; corolla (diam. semipoll.) ochroleuca maculis fusco-luteis; calyce sub anthesi lin. 2 longo in lobos lato-subulatos ultra medium usque fisso, fructifero ovato tereti lin. 5 longo, nervis inconspicuis, dentibus tubo brevioribus; seminibus crassiusculis immarginatis favoso-rugulosis. — Limestone cliffs, Santa Eulalia Mountains, near the city of Chihuahua, *Pringle*, 317. The late Mr. Miers, who did much work upon *Solanaceæ*, when describing a new species of the present genus, remarked that "all the species of *Physalis* are too well known and described to require any observation." We heartily wish they were.

Scrophulariaceæ.

PENTSTEMON COCCINEUS, Engelm. Pl. Wisl. 107. *Elmiger*; caule 1-2-pedali superne nudo gracili simplici vel subramoso racemoso-paucifloro (pedicellis gracilibus 1-2-bracteolatis sed unifloris); foliis linearibus imisve oblongis, summis setaceo-subulatis; corolla miniata *P. imberbis* sed magis ventricosa e tubo brevi angusto; antheræ loculis divaricatis modo *P. barbati*; filamentum sterili exserto apice subito dilatato nudo. (*P. barbatus*, var. *Wislizeni*, Gray, Proc. Am. Acad. vi. 59.) Var. FILIFOLIUS, foliis omnibus filiformibus vel angustissime linearibus; corolla demum violascente. — About 150 miles north of Batopilas, *Palmer*, 432. Not far from the district in which Dr. Wislizenus collected *P. coccineus*, Engelm., — a species to be restored,

although the name probably is not the most appropriate. Dr. Engelman noted the flowers as "bright scarlet or crimson"; the latter seemingly is the more correct. Dr. Palmer describes the corolla of his plant as "bronzy red, changing to bluish." The anther-cells at the line of dehiscence are sparsely spinulose-ciliate in Palmer's specimens; in those of Wislizenus, hardly at all so.

PENTSTEMON FASCICULATUS. Fruticulosus, pedalis, glaber, *P. pinifolio*, Greene, sat similis; ramis fastigiatis foliosissimis; foliis filiformibus seu acerosis rigidulis (circ. pollicaribus) oppositis confertis et in axillis fasciculatis, floralibus subulato-setaceis; racemo paucifloro, pedunculis inferioribus nunc bifloris; sepalis obovato-rotundis apiculatis; corolla coccinea ($\frac{3}{4}$ -pollicari) tubulosa sursum sensim ampliata vix bilabiata, lobis 5 brevibus rotundato-ovatis subpatentibus; antheræ glabræ loculis demum explanatis suborbiculatis filamentoque sterili filiformi apice dilatato nudo e corolla haud exsertis. — At the Frailes, half-way between Batopilas and the Cumbre, or mountain summit, *Palmer*, 264.

PENTSTEMON CAMPANULATUS, Willd. At Yerba Buena, north of Batopilas, about 7,000 feet above sea-level, *Palmer*, 307. The most northern habitat known.

STEMODIA PALMERI. Inter *S. peduncularem* et *S. Jorullensem* collocanda, villosa, subviscosa, pedalis e radice annua? ramis diffusis; foliis oppositis (nec ternis) membranaceis longius petiolatis ovatis crenato- nunc duplicato-dentatis basi aut truncatis aut subcuneatis (lamina 6-10 et petiolo 3-5 lin. longa); pedunculis solitariis geminisve petiolo æquilongis; sepalis lineari-attenuatis corolla (lin. 5 longa) vix dimidio brevioribus; stigmatibus bilamellato vix infundibuliformi; placentæ post dehiscentiam apice bifido. — Shaded grounds, near Batopilas, *Palmer*, 221, the corolla purple with yellow throat; 250, with corolla white.

SEYMERIA VIRGATA, Benth. Coll. Pringle, 647. Besides this, which has by no means a virgate growth, Mr. Pringle collected specimens (567) referable to *S. pinnatisecta*, Seemann; and Palmer (325) another form on the higher mountains above Batopilas. The pubescence, foliage, and even the shape of the capsule, vary from specimen to specimen. Probably all of them (even the Texan one with short pedicels) belong to one polymorphous species.

LAMOUREUXIA CORDATA, Cham. & Schlecht. in Linnæa, v. 103.*

* This name is retained, under the impression that the species is not to be merged in *L. viscosa*, HBK. Perhaps No. 703 of Ghiesbreght's Chiapas collec-

At the Frailes, above Batopilas, at over 7,000 feet: corolla (puberulent externally) said to be "bright carmine," *Palmer*, 258.

LAMOUROUXIA COCCINEA. *Hemispadon*, *L. cordatæ* soror, tantum puberula; foliis ovato-oblongis basi lata subcordata arcte sessilibus crebre serratis, superioribus spicas laterales sæpius fulcrantibus; calycis vix visciduli dentibus tubo haud longioribus; corolla læte coccinea tubulosa (nec ventricosa) sesquipollicari extus tenuissime puberula, labiis tubo dimidio brevioribus, galea oblonga recta; filamentis posticis tenuibus anantheris glabris; capsulis parvulis (lin. 4 longis) calyce fere inclusis. — Rocky hills near the city of Chihuahua, *Pringle*, 656.

LAMOUROUXIA HYSSOPIFOLIA. *L. longifloræ* peraffinis, "frutescens tripedalis," sed ramis floridis gracilibus herbaceis foliosissimis; foliis spathulato-lanceolatis (majoribus vix ultra-pollicaribus), floralibus parvis; floribus patentissimis; calycis lobis tenui-subulatis tubo suo brevioribus; corolla miniata glabra antice ventricosa vix ultra-pollicari, galea lata spathacea obtusissima edentata. — At the Frailes in the mountains above Batopilas, at about 7,000 feet, *Palmer*, 260. Corolla said to be crimson, but seemingly pure red. — *L. longiflora* is not very well named, the corolla in our specimen from Hartweg being only an inch and a half long; in those of Seemann's collection hardly of that length, but rather more ventricose; in both the calyx-lobes are elongated and filiform. The present species has a more gibbous ventricose as well as smaller corolla, and the slightly recurved galea is not at all notched or toothed.

CASTILLEIA MEXICANA. *C. sessilifloræ* proxima, hirsutula, corollæ ("ochroleucæ viridulo et roseo parum tinctæ") tubo prælongo labioque ampliori insignis. — *Orthocarpus Mexicanus*, Hemsl. Biol. Centr.-Am. Bot. ii. 463, t. 63, f. 1-6. — I see no good reason for referring this and the closely related *C. sessiliflora* to *Orthocarpus*; certainly none in any particular affinity with *Orthocarpus australis*. The lips of the corolla are no more nearly equal than in *C. pallida*; bifid calyx-lobes are common in the genus; and the lip of the corolla is not at all saccate in the present species. The elongated corolla-tube is, indeed, peculiar, but that is not particularly characteristic of *Orthocarpus*. Cool hillsides west of Chihuahua, *Pringle*, 209.

PEDICULARIS ANGUSTIFOLIA, Benth. Pl. Hartw. 22. Summit of the higher mountains above Batopilas, at 8,800 feet, *Palmer*, 326.

tion is of still another species. The corollas are nearly two and a half inches long, completely cylindrical; the anthers extremely long-woolly, and the sterile filaments pubescent at and toward the apex.

Probably perennial, a foot high, freely branched; lowest leaves wanting; but all that are present are very narrow and simple, as in Hartweg's plant.

Acanthaceæ.

CALOPHANES BILABIATA, Seem. Bot. Herald, 324, t. 65. Hillsides near Batopilas, *Palmer*, 235. Although unusually bilabiate for this genus, the corolla-lobes (at least in Bourgeau's plant) are convolute in the bud.

JUSTICIA CAUDATA. *J. salvæfloræ*, HBK. affinis, sed præter pubem minutam foliorum et bractearum glabra; foliis ovatis summisve lanceolatis promissa caudato-acuminatis (majoribus 5-pollicaribus); corolla sesquipollicari ventricosa tubo incurvo antherisque glabris. — Shady ravines, near Batopilas, *Palmer*, 189. Seemann figures *J. salvæflora* (under *Sarothecæ*, Nees), which he collected in the Sierra farther south, with corolla as well as calyx and bracts conspicuously glandular-pubescent, and anthers hirsute.

JACOBINIA OVATA. Fruticosa, effuse ramosa; foliis ovatis sub-acuminatis eximie penninerviis (sesquipollicaribus et petiolo lin. 3 longis) basi rotundatis supra viridibus puberulis subtus cum ramulis gracilibus mollissime pubescentibus subincanis; floribus subsolitariis paucisve; calycis alte 5-partiti segmentis linearibus acuminatis; corolla miniata puberula pollicari, labiis tubo angusto dimidio brevioribus, lobis angustis. — Shaded rocks near Batopilas, *Palmer*, 220. In pubescence and venation of the leaves somewhat like *J. incana*, the corolla more like that of *J. Mexicana*, Seem., from the same region; but in calyx, inflorescence, &c., very different from either.

CARLOWRIGHTIA SERPYLLIFOLIA. Suffrutex pedalis, tortuosoramosus, minute scabrido-puberulus; foliis parvis (cum petiolo lin. 3–4 longis) ovalibus ovatisque subnerviis (nunc triplinerviis); calycis segmentis setaceis stipiti capsulæ (sat valido eo æquilongo) adæquantibus; corolla purpurea. — Mountains near Jimulco, in Coahuila, *Pringle*, 218.

CARLOWRIGHTIA ARIZONICA, Gray, Proc. Am. Acad. xiii. 364, & Syn. Fl. ii. 327. Suffrutex ramosissimus, microphyllus; foliis sessilibus oblongis lanceolatisque (lin. 2–4 longis) eveniis; calycis brevi segmentis subulatis stipite gracili (capsula longiore) 3–4-plo brevioribus. — This is here re-characterized from much more complete specimens than were before known, collected by *Pringle* in the mountains near Tucson, Arizona, and distributed in 1884.

CARLOWRIGHTIA LINEARIFOLIA, Gray, l. c., one of the original species, apparently as frutescent as the foregoing, and with filiform-linear

leaves, seems not to have been met with since its discovery by Mr. Wright in 1849. In all these species the anther-cells, though strictly parallel, are slightly oblique in position: there is no dilatation of the connective. The following is clearly a congener, and it takes with it the ambiguous *Dianthera parvifolia*.

CARLOWRIGHTIA OVATA. Caulibus herbaceis e caudice ligneo dif-fuso-procumbentibus fere glabris lævibusque gracilibus; foliis caulinis late ovatis acutis semipollicaribus penniveniis glabellis brevi-petiolatis, ramealibus ovato-lanceolatis, superioribus ad bracteas calyce tamen breviores reductis; corolla purpurea; calycis segmentis setaceo-subulatis stipitem capsulæ æquantibus; antheræ loculis brevi-ovalibus parum obliquis. — Rocky hills near the city of Chihuahua, *Pringle*, 995.

CARLOWRIGHTIA PUBENS. Caulibus fere herbaceis e caudice lig-nescente adsurgentibus cum foliis (ovatis obtusis paucivenosis petio-latis) pubescentibus vel hirsutulis; calycis segmentis subulato-setaceis stipitem capsula brevior subæquantibus. — *Dianthera? parvifolia*, Gray, Syn. Fl. ii. 330; name inappropriate in the present genus. Rocky hills near the city of Chihuahua, *Pringle*, 65. Mr. Watson had suggested the reference of this plant to the present genus in Proc. Am. Acad. xviii. 133.

CARLOWRIGHTIA CORDIFOLIA. Glabra; caulibus e basi fruticulosa diffusis gracilibus; foliis majoribus dissitis membranaceis cordatis acutis pollicaribus et sesquipollicaribus cum petiolo gracili semipollicari; floribus secus ramos filiformes nudos laxè spicatis secundis; bracteis sepalisque minimis subulatis; corolla alba; antheræ loculis brevi-ovalibus contiguè æqualibus; stipite capsula æquilongo calyce bis superante. — On ledges in the mountains above Batopilas, *Palmer*, 224.

ANISACANTHUS INSIGNIS, Gray, Syn. Fl. ii. 457 (Suppl.), where the species are revised. — A fine species, formerly collected in Chi-huahua by *Gregg*, later by *Palmer*, and now, in better specimens, by *Pringle*, 268. Dr. Havard found a form of it in the mountains on the Texan side of the Rio Grande. Mr. Pringle also collected one or two specimens of the true *A. virgularis*.

HENRYA COSTATA. Tenuiter pubescens, decumbens; foliis ovatis parvulis (haud ultrapollicaribus cum petioli lin. 1–3 longo) insigniter 10–14-costatis cuspidulatis; involucri bracteis mucronato-cuspidatis hinc connatis; corolla semipollicari, loculis antherarum elongato-oblongis inæqualibus. — Near Batopilas, pendent from precipitous rocks, *Palmer*, 211. It must be that *Henrya* of Nees is a good genus, and that this is a distinct species. The corolla is said to be straw-color.

Verbenaceæ.

VITEX MOLLIS, HBK.; Seem. Bot. Herald, 329, t. 71. Ravines near Batopilas, *Palmer*, with mature fruit, which seems to have been nearly unknown. Seemann, indeed, gives the character "capsula obovato-rotundata glabra," but the specimen figured is in flower only. The fruit now in hand is a globose drupe, half an inch or more in diameter, with thin pulp and a very thick bony putamen. Dr. Palmer notes that the fruit, called *Uvalama*, is eaten by the Indians, either raw or cooked.

Labiataæ.

HYPTIS SEEMANNI. Facie *H. stellulata*, Benth., pube molliori tomentoso-canescens; caule herbaceo orgyali; foliis oblongo-lanceolatis rugulosis creberiter crenulatis basi rotundatis (2-3-pollicaribus cum petiolo subsemipollicari); capitulis seu verticillastris globosis modo *H. stellulata* concatenatis; bracteis subulatis minimis deciduis; calyce obconico (etiam fructifero haud ultra lineam longo), dentibus subulatis erectis mollibus tubo villosissimo dimidio brevioribus intus fauceque lanosissimis; corolla parum exserta. — N. W. Mexico, probably the species merely mentioned from "Cerro de Pinal," *Seemann*. Mountain-sides above Batopilas, *Palmer*, 177.

HEDEOMA COSTATA, Gray, Syn. Fl. ii. 363, 1878; Hemsl. Biol. Centr.-Am. ii. 547, 1882, where by oversight it is taken up as original. — Mountains near the city of Chihuahua, *Pringle*, 133. Near Batopilas, *Palmer*, 441. So this species has a wide range in Mexico, and Dr. Havard found it in the mountains on the Texan side of the Rio Grande, but in forms which too nearly approach *H. plicata* and *H. dentata*.

SALVIA TILÆFOLIA, Vahl. This common weed in Mexico is, according to Dr. Palmer, the *Chia* of the district he visited, the seeds of which are largely infused for a mucilaginous drink, as is done in Arizona and California with *S. Columbaria*.

SALVIA MICROPHYLLA, HBK., Nov. Gen. & Spec. ii. 295. The plants here referred (including 748, 739, *Parry & Palmer*, and 662, *Schaffner*) very well accord with the original character, except as to degree of pubescence, having at most a trace of "calycibus hirtis," but coming near to Bentham's "nervis pubescentibus," and they do seem to run into the larger-leaved *S. Grahami*, Benth.

Var. *CANESCENS*, Gray in Distrib. *Pringle*, may be near the original, as it is the most pubescent form, and the rugose small leaves are densely

canescently pubescent on both sides. — Hills near Zacatecas, *Pringle*, 239. Some of Parry and Palmer's 739 come very near to it, and have hirsute pubescence on the branchlets.

Var. *WISLIZENI* is more herbaceous and greener, merely puberulent, but the calyx-nerves are more obviously hispidulous, the small leaves less crenulate and not rugulose. — Sierra Madre west of Chihuahua, *Wislizenus*, 152. Not far south of this, i. e. 150 miles north of Batopilas, *Palmer*, 379.

SALVIA LYCIOIDES. *Calosplax*, frutescens, viridis, sub lente minutissime puberula; ramis gracilibus elongatis foliosis; foliis parvis (majoribus semipollicaribus) angusto-oblongis obtusis integerrimis raro paucidenticulatis basi contracta subpetiolatis, venis obscuris, floralibus minimis caducis; verticillastris 2-4-floris; corolla semipollicari cærulea calyce triplo longiore sub fauce ventricosa glabra, labio postico oblongo apice puberulo, antico parum longiore rotundato trilobo. — Santa Eulalia Mountains, near the city of Chihuahua, *Pringle*, 52. I know no species with which this may be particularly compared. The foliage might be likened to that of a *Lycium*; whence the name.

SALVIA ALBIFLORA, Mart. & Gal., at least the plant so named in Mex. Bound. Survey, from the Mexican border. Shady ravines near Batopilas, *Palmer*, 154. Forma *CÆRULESCENS*, with "corolla light blue, often almost white when in shade," *Palmer*, 96; also "bright blue in shady ravines," *Palmer*, 157. Since Linden records the color of the corolla in his specimens as pale blue, we may safely refer all of Palmer's to one species. Seemann's plant referred to *S. flexuosa* differs only in a slightly larger calyx.

SALVIA PALMERI. Herbaceæ, suborgyalis, *S. polystachyæ* peraffinis, thyrsos pariter contracto densifloro; foliis ovatis rarius subcordatis tantum serrulatis haud rugoso-venosis supra viridibus fere glabris subtus incanis; stylo nudo vel parce pilosulo. — Hillsides at the Frailes, on the mountains above Batopilas; blue-flowered, *Palmer*, 259. The difference in hue between the two faces of the leaf is striking, especially in the younger leaves; the whiteness of the lower face, unlike that of *S. polystachya*, is from a pubescence too minute and close to be distinguished into separate hairs, even with a lens, and is persistent.

CEDRONELLA MICRANTHA, Gray. About 150 miles north of Batopilas, *Palmer*, 420, with the same minute corollas before known.

CEDRONELLA AURANTIACA. Puberulo-incana; foliis deltoideolanceolatis vel subhastatis subcrenatis (1-2-pollicaribus cum petiolo $\frac{1}{4}$ -pollicari) supra viridibus subtus canis; thyrsos superne nudo laxifloro; calyce campanulato fere herbaceo (lin. 2 longo), dentibus deltoi-

deis obtusiusculis, duobus paullo brevioribus; corolla ultrapollicari pallide aurantiaca ea *C. Mexicana* referente sed inferne magis attenuata.—Ravines 150 miles north of Batopilas, *Palmer*, 402. Singular in the color of the corolla, which, if not yellow, is “salmon-color,” as well as in the short and broad-toothed calyx.

3. *Miscellanea.*

SIDALCEA.

M. Alphonse De Candolle, in the Preface to the “Calques des Dessins de la Flore du Mexique de Moçino et Sessé,” several years ago pointed out the fact that the original *Sida malvæflora*, DC., was not the plant of the Botanical Register, and not the plant taken up by me as *Sidalcea malvæflora*. Also I had recognized Moçino’s drawing to belong to what I had named *Sidalcea humilis*, the common species of the Californian coast; but I had deferred calling attention to it until I could revise the whole genus and rectify the synonymy. In consequence of this inadvertence Mr. Greene did not know of this correction when he published his revision of *Sidalcea*, a year or more ago. For the present it suffices to note that the name SIDALCEA MALVÆFLORA belongs to the *Sida malvæflora*, Hook. & Arn., &c., and has *Sidalcea humilis*, Gray, Pl. Fendl., for a synonym; while the other names, *S. Neomexicana* and *S. Oregana* of Pl. Fendlerianæ, come into use for the interior-country species.

Two of the annual species which, in the Botany of California, Mr. Watson inadvertently combined, are quite distinct, and were fairly well characterized in the original account of the genus, viz. *S. Hartwegi* and *S. hirsuta*. A year ago I found them growing near each other, in exsiccated pond-holes or pieces of depressed ground in grain-fields, on the Rancho Chico of the esteemed Gen. John Bidwell, where, as I suppose, Hartweg found them. The former also grows on elevated ground along the borders of Chico Cañon.

S. HARTWEGI, Gray, Pl. Fendl. 20, & in Pl. Hartw. 300, is slender and much smaller than the other; with only fine and short pubescence on the higher parts, loosely and paniculately branching, and sparsely flowered; the corolla of a deep pink purple and from one third to two thirds of an inch long. The carpels are whole and closed when they separate from the axis, are strongly reniform-incurved or with basal portion straighter, the whole of the firm dorsal portion strongly rugose-reticulated, the rugæ sharp and salient, especially on

the sides; the soft apiculation inconspicuous and at length deciduous. Hartweg's specimens are small, few-flowered, and not in fruit. Without much doubt the *S. tenella* of Greene, from the Little Chico Creek, is a depauperate and very branching form of *S. Hartwegi*, with flowers much reduced in size. Prof. Rattan collected specimens on Stony Creek, Colusa Co., which are fairly intermediate.

S. HIRSUTA, Gray, Pl. Wright. i. 16, (which in Pl. Fendl. and Pl. Hartw. I mistook for Nuttall's *Sida delphinifolia*), is stout, taller, with more or less hirsute pubescence; the stem and erect branches terminated with a dense spike or spiciform cluster of flowers; the corolla more rose-colored, from three fourths to nearly a full inch long. The carpels were very well described long ago in Pl. Fendl., and well figured in my Genera Illustrated. They are not sensibly incurved, are surmounted by a conspicuous soft and hairy beak, the thin ventral portion tears open on separation from the receptacle, and the back is lightly reticulated.

S. CALYCOSA, of Marcus E. Jones in the American Naturalist, from Duncan's Mills, on Russian River, is a badly named but apparently good species, nearly allied to the preceding. Its calyx-lobes are broader, shorter, and hirsutely long-ciliate; the carpels are striately nervose on the back (the reticulations being very long and narrow); and the apiculation is apparently obsolete. This proves to be the *S. sulcata* of Curran, fide Greene in Bull. Calif. Acad. i. 79, a better name.

S. DIPLOSCYPHA, Gray, the remaining species of the group, is not to be confounded with any other; but the variety, *minor*, seems to be well marked. This species and *S. hirsuta* ought to be in ornamental cultivation.

LYONOTHAMNUS, Gray, Proc. Am. Acad. xx. 291.

Char. fruct. Folliculi 2 (rarissime 3) parvi, ovati, stylo brevi demum deciduo mutici, crasso-coriacei, glandulis substipitatis scabrati, sutura ventrali (demumque dorsali?) dehiscentes. Semina (1 vel 2 maturescentia) elongato-oblonga, parum arcuata; testa membranacea secus raphen anguste alato-marginata. Embryo (vix matura) in albumine parco inclusus, leviter arcuatus; radícula supera cotyledonibus oblongis paullo brevior.

LYONOTHAMNUS FLORIBUNDUS, Gray, l. c. Upon revisiting the island of Santa Catalina in the early part of the summer of 1885, Mr. Lyon collected specimens of this interesting shrub, with forming fruit, not quite mature indeed, but enough so to furnish a few seeds with a

full-grown embryo. Having waited in vain for better material, I now give the carpological characters, drawn from what we possess.

LYONOTHAMNUS ASPLENIFOLIUS, Greene, Bull. Calif. Acad. i. 187. Folia pinnatisecta in segmenta 3-5 approximata lato-linearia pinnatipartita, lobis crebris semilunato-deltaideis. — Faint indications of stipules are seen in this species, of which the known materials are still imperfect. It is hoped that Santa Cruz Island, off Santa Barbara, and the other islands of that coast, may soon be explored.

This is another of those genera which tend to obliterate the distinctions between the *Rosaceæ* and the *Saxifragaceæ*. Notwithstanding the likeness to *Vauquelinia*, I still incline to refer this genus to the latter order (next to *Jamesia* and *Fendlera*), on account of the opposite leaves, dicarpellary ovary, and albuminous seeds, although indeed the albumen is thin. *Vauquelinia* is obviously Rosaceous. Both the species (*V. corymbosa* and *V. Torreyi*) not rarely show minute adnate stipules to their alternate leaves; and they have more than "two" — at least four — ovules in each cell of the 5-merous and syncarpous ovary, all ascending from next the base of the cell. The seeds have an apical wing, as figured, and are completely exalbuminous, the broad and flat cotyledons filling the seed-coat completely.

The following has already been published in a Supplement to a second issue of the Synoptical Flora (pp. 448, 449); but it is thought best still to print here the original description.

DIMERESIA, Nov. Gen. *Comp.-Inuloidearum*.

Capitula biflora, discreta, homogama. Involucrum diphyllum; bracteis herbaceis oblongis basi tantum connatis, utrisque florem hermaphroditum fere amplectentibus. Corollæ tubulosæ, regulares, 5-dentatæ. Antheræ basi breviter caudato-sagittatæ. Styli rami angusto-lineares, obtusi, ad apicem usque lineis stigmaticis marginati. Achenia clavato-pyriformia, multistriata, glabra, areola epigyna parva. Pappus e setis 20 validis plumosis uniseriatis basi in anulum connatis, mox deciduus. — Herbula annua, depressa, vix caulescens, glabrata; foliis rosulato-confertis crassiusculis obovatis integerrimis 3-5-nervatis basi in petiolum marginatum angustatis; capitulis subsessilibus plurimis inter folia congestis; floribus ut videtur albidis.

DIMERESIA HOWELLII. — On Stein's Mountain, in southeastern part of Oregon, June, 1885, *Thomas Howell*. Also received, since this account was written, from *W. C. Cusick*, who found it a little later in the same district. — A singular little plant, named from the two-flowered heads, with involucre reduced to two bracts, one sub-

tending each flower. Not obviously of near relationship to any other known genus; but clearly of the tribe *Inuloideæ* by the style and anthers, although it does not fall well into any of the characterized subtribes. Yet it is most like the *Angiantheæ*.

ASTRAGALUS NEVINII. *A. Drummondii* et *A. racemoso* ut videtur parum affinis, pube brevi adpressa canescens; foliolis plurimis oblongis retusis; pedunculo subcapitato-plurifloro; calycis nigricantis dentibus tubo campanulato paullo brevioribus; corolla (vix evoluta) alba; leguminibus patentibus glabris tenuiter transversim reticulatis oblongis arcuatis utrinque subacutis dorso late sulcato intrusis bilocellatis ventre acutatis (sectione transversa latissime Y-formi) in stipitem calyce bis superantem repente contractis. — Island of San Clemente, off Southern California, Messrs. *Nevin* and *Lyon*, April, 1885. Apparently a low species, with stems only a foot high.

SOLIDAGO ERECTA, Pursh. The proper reference of this obscure species was inadvertently omitted from the Synoptical Flora, even from the recent Supplement. So it may here be recorded that no specimen bearing this name can be found in the Banksian herbarium. But there is a "*S. stricta* β , Mss." which answers the conditions. This appears to be the *S. bicolor*, var. *concolor*, of the Flora; and so *S. erecta* may be the proper name for this ambiguous Golden-rod, if (as is probable) it comes to be recognized as a species. *S. erecta* of Elliott may be the smoother form of it.

SOLIDAGO ELATA, Pursh, also should have been more definitely referred to in the Syn. Flora. The three sheets of it in the Banksian herbarium seem to belong to as many species. The first, a specimen from a cultivated plant, seemed to me to be *S. sempervirens*, var. *viminea*. The second, from "New Jersey, Bartram," has the panicle abnormally branched through an early injury to the summit of the stem. I took it probably to be the *S. bicolor*, var. *concolor*. The third, "*S. elata*, Mss. & herb. Miller," apparently from a cultivated plant, seemed to be a form of the European *S. Virgaurea*.

LESSINGIA LEMMONI. *L. Germanorum* sat similis, magis robusta; indumento tenuiore; capitulis paullo majoribus; corollis luteis, exterioribus limbo ampliato; styli ramis in cuspidem subulatam longe productis; acheniis turbinatis albo-villosissimis; pappo multisetoso subæquali. — At Ash Fork, in northern part of Arizona, *Lemmon*. — This species requires a modification of the character of the first section of the genus in the Syn. Fl. i.² 162, as to the style-appendages, which are like those of the white- and purple-flowered section. And the species is more eastern than any other.

HELIANTHUS CUSICKII. *H. Nuttallii* et *H. gracilentii* parum affinis, multicaulis e caudice crasso perpendiculari resinifero, strigosus, sæpe hispidulus; caulibus ultrapedalibus ramisve monocephalis demum reclinatis; foliis plerisque alternis lineari- seu angusto-lanceolatis integerrimis obtusiusculis basi attenuata sessilibus leviter trinervatis fere eveniis; involucri (vix ultra-semipollicaris) bracteis angusto-lanceolatis sensim acuminatis hirtis ciliatis demum laxis; ligulis (1-1½-pollicaribus) elongatis; acheniis glaberrimis; pappi paleis oblongo-lanceolatis majusculis, squamellis nullis. — A very marked species, of the Desert region, first received from Mr. Cusick, then from Mr. Brandegee. On dry hills near the Malheur River, S. E. Oregon, coll. in early summer of 1885, in flower, *Cusick*. "Has thick and succulent roots, an inch or two in diameter, of a sweetish taste." Among sage-brush, in the northern Yakima region, Washington Terr., Oct., 1885, *Brandegee*, with flower and fruit, "forming clumps, the many stems at length resting on the ground in an entangled mass."

ARTEMISIA PYGMÆA. *Seriphidium*, fruticulosa, spithamæa e caudice crasso lignoso, multicaulis, tenuiter canescens, demum glabrata; foliis (lin. 2-5 longis) rigidulis pinnati-3-7-partitis, segmentis subulato-linearibus obtusiusculis; capitulis spicatis folio fulcrante longioribus; involucri cylindræo (lin. 2-3 longo), bracteis pluriseriatis lineari-oblongis glabellis chartaceis margine scariosis, inferioribus dorso crassiore viridulo; floribus 3-4 et achenio (immature) glabris. — Desert region of Nevada, at Fisk Creek near Eureka, *Brandegee*, August, 1885.

ECHINOSPERMUM BRACHYCENTRUM, Ledeb. Fl. Alt., & Ic. Fl. Ross. iv. t. 302. — Var. **BRACHYSTYLUM**. — Spence's Bridge, Thompson River, Brit. Columbia, *J. Fletcher*, fide *Macoun*. — A low and villous-hirsute leafy-bracteate species, but the bracts short; the nutlets convex on the back within the low callous margin, which bears scattered lightly glochidiate papillæ or extremely short setæ (or even these sometimes obsolete), and is not at all carinate. Our plant accords well with Ledebour's figure, except that the style is not exerted beyond the apex of the nutlets.

MIRABILIS BIGELOVII. Viscosissimum, villosum, caulibus foliisque rotundatis flaccidis; perianthio pallido involucri parum superante; cæt. fere *M. Californicæ*. — *Oxybaphus glabrifolius*, Torr. Pacif. R. R. Exp. iv. 131, quoad pl. Colorad. valde pubescens. — Arizona, and perhaps in California on the Colorado. Common in the Grand Cañon of the Colorado, below Peach Spring, collected May 5, 1885, *A. G.*